

EMORY EASTSIDE MEDICAL CENTER

EMORYHEALTHCARE



Quick Reference Drug Book

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Conscious Sedation Medications

1. **MORPHINE**

Dose: 0.1-0.2 mg/kg IV/IM for both adults and pediatrics

Onset: Almost immediate

Peak: 5-20 minutes

Duration: 2-7 hours

Effects: Analgesia. Drowsiness, mental clouding, papillary constriction, vasodilation, n/v, GI hypomotility, **hypotension, respiratory depression**

Contraindications: Head injury, low respiratory rate

2. **SUBLIMAZE (fentanyl)**

Dose:

Adult: 25-100mcg IV; dose may be repeated after 3 minutes; use of a benzodiazepine may potentiate fentanyl's effect

Pediatric: 1-2 mcg/kg; give over 3-5 minutes

Onset: Immediate

Peak: 5-15 minutes

Duration: 30-60 minutes

Effects: Analgesia. Sedation, euphoria, n/v, respiratory depression, GI hypomotility, hypotension, rigidity

Other: Muscle rigidity can involve the thorax making respiration/ventilation difficult; can be overcome with muscle relaxants or narcosis.

3. **NOCTEC (chloral hydrate)**

Dose: 50-100 mg/kg orally in pediatric

Onset: 30-60 minutes

Duration: 4-8 hours

Contraindications: GI disorders, hepatic/renal disease

4. **VALIUM (diazepam)**

Dose:

Adults 2-5 mg IM/IV adult (titrate IV): slow IVP over 1 minute

Pediatric: 0.04-0.2 mg/kg IV

DO NOT EXCEED 5mg per minute (3 minutes in pediatrics)

Onset: 1-2 minutes IV and 15-20 minutes IM Peak: 3-4 minutes

Duration: 15-60 minutes

Effects: Respiratory depression, hypotension, agitation, n/v, dizziness

Contraindications: Narrow angle glaucoma, psychosis

Other: Rapid IVP can cause apnea!

5. **VERSED (midazolam)**

Dose:

Healthy adults: 1-2.5 mg initial dose IV then titrate, give over 2 minutes; wait 2 minutes after each dose: max total dose of 5 mg.

Patients > 60 years old or chronically ill: 1-1.5 mg initial dose IV then titrate, give over 2 minutes; wait 2 minutes after each dose: max total dose of 3.5 mg.

Pediatric: 0.1 – 0.15 mg/kg IV; May give w/ fentanyl for synergistic effect. Don't exceed a total dose of 0.5 mg/kg or 10mg.

Onset: 1-5 minutes

Peak: 5-30 minutes

Duration: 2-6 hours

Effects: Sedative, anxiolytic, muscle relaxant, respiratory depressant, hypotension, agitation, n/v

Contraindications: Acute narrow angle glaucoma

6. **NARCAN (naloxone) (opioid antagonist)**

Dose:

Adults: 0.4-2 mg IV titrated to effect, repeat in 2-3 minute interval

-If dose exceeds 10mg without adequate response, depressive condition may not respond to naloxone

Pediatrics: 0.01 mg/kg IV/IM. If dose is ineffective, may give 0.1 mg/kg

-Patients greater than 5 years and 20 kg may receive adult doses

Onset: 2-3 minutes

Other: Repeated doses may need to be given as the duration of opioids may exceed Narcan

Effects: Hypertension, irritability, tachycardia

7. ROMAZICON (flumazenil) (benzodiazepine antagonist)

Administration: Due to irritation, give over 15-30 seconds in free flowing IV in a large vein

Adults dose: 0.2 mg IV, may repeat after 45 seconds up to five (5) total doses

Pediatric dose: 0.01 mg/kg up to 0.2 mg, may repeat after 45 seconds

Onset: 1-2 minutes

Other: If more doses are needed, additional series of 0.2mg x 5 doses may be given every 20 minutes for total of 3 mg/hr.

Effects: Agitation, hypertension, anxiety, tachycardia, N/V, tremors

8. KETAMINE

Patient's (receiving only ketamine) must be age 12 months to 10 years. Patients older than 10 years require co-administration of a benzodiazepine to prevent emergency reactions. Administration: Give ketamine 4mg/kg with atropine 0.01mg/kg (minimum 0.1mg, maximum 0.5mg of atropine) in same syringe and give IM when MD is ready to start procedure. If sedation is inadequate after 10 minutes, an additional dose of ketamine 2mg/kg IM can be given. Duration of action should be 15-30 minutes.

Dosing Chart:

Weight (kg)	Ketamine (mg) (10mg/ml)	Ketamine (ml)	Ketamine (mg)	Ketamine (ml)	Atropine (mg)	Atropine (ml from 0.4mg/ml vial)
	4 MG/KG DOSE		2 MG/KG DOSE			
5	20	2	10	1	0.1	0.25
6	24	2.4	12	1.2	0.1	0.25
7	28	2.8	14	1.4	0.1	0.25
8	32	3.2	16	1.6	0.1	0.25
9	36	3.6	18	1.8	0.1	0.25
10	40	4	20	2	0.1	0.25
11	44	4.4	22	2.2	0.11	0.28
12	48	4.8	24	2.4	0.12	0.30
13	52	5.2	26	2.6	0.13	0.33
14	56	5.6	28	2.8	0.14	0.35
15	60	6	30	3	0.15	0.38
16	64	6.4	32	3.2	0.16	0.40
17	68	6.8	34	3.4	0.17	0.43
18	72	7.2	36	3.6	0.18	0.45
19	76	7.6	38	3.8	0.19	0.48
20	80	8	40	4	0.2	0.50
21	84	8.4	42	4.2	0.21	0.53
22	88	8.8	44	4.4	0.22	0.55
23	92	9.2	46	4.6	0.23	0.58
24	96	9.6	48	4.8	0.24	0.60
25	100	10	50	5	0.25	0.63
26	104	10.4	52	5.2	0.26	0.65
27	108	10.8	54	5.4	0.27	0.68
28	112	11.2	56	5.6	0.28	0.70
29	116	11.6	58	5.8	0.29	0.73
30	120	12	60	6	0.3	0.75
31	124	12.4	62	6.2	0.31	0.78
32	128	12.8	64	6.4	0.32	0.80
33	132	13.2	66	6.6	0.33	0.83
34	136	13.6	68	6.8	0.34	0.85
35	140	14	70	7	0.35	0.88
36	144	14.4	72	7.2	0.36	0.90
37	148	14.8	74	7.4	0.37	0.93
38	152	15.2	76	7.6	0.38	0.95
39	156	15.6	78	7.8	0.39	0.98
40	160	16	80	8	0.4	1.00
41	164	16.4	82	8.2	0.41	1.03
42	168	16.8	84	8.4	0.42	1.05
43	172	17.2	86	8.6	0.43	1.08
44	176	17.6	88	8.8	0.44	1.10
45	180	18	90	9	0.45	1.13
46	184	18.4	92	9.2	0.46	1.15
47	188	18.8	94	9.4	0.47	1.18
48	192	19.2	96	9.6	0.48	1.20
49	196	19.6	98	9.8	0.49	1.23
50	200	20	100	10	0.5	1.25 (MAX AMOUNT OF ATROPINE)

RAPID SEQUENCE INTUBATION

POST INTUBATION SEDATION/PARALYSIS

All intubated patients should be aggressively sedated and treated for pain and agitation as appropriate. Aggressive sedation and analgesia after intubation may negate the need for paralysis therefore, patients should only be paralyzed after aggressive sedation and analgesia has failed to produce desired results or sedation is contraindicated. Continuous aggressive sedation/analgesia must be administered to all patients that have been paralyzed. Post intubation HR & BP should be used to help guide the dosing of sedation and analgesia. Opioid analgesics may be useful adjuncts especially in patients with pain.

SEDATIVES

Agent	Adult Dosage	Pediatric Dosage
Ativan (lorazepam)	2-4 mg IVP initially, can repeat dose q 20 minutes (See also page 13)	0.05mg/kg (not to exceed 2-4mg dose used in adults)
Versed (midazolam)	1-2 mg IVP q 2-3min until desired effect (See also page 57)	0.05—0.1 mg/kg IV given 3 minutes before procedure.

NEUROMUSCULAR BLOCKING AGENTS

Agent	Adult Dosage	Pediatric Dosage
Anectine (succinylcholine)	Average dose is 0.6 mg/kg IV (range 0.3—1.1 mg/kg) given over 10—30 seconds.	Avoid use due to rare risk of succinylcholine-induced acute rhabdomyolysis
Norcuron (vecuronium)	60 – 85mcg/kg IV initially, then 10 – 15mcg/kg after 25 – 40 minutes, then PRN every 15 minutes. Alternatively, 1 mcg/kg/minute by IV infusion can be given after the effects of the initial dose begin to subside, then adjusted to attain clinical goals.	80 – 100mcg/kg IV initially, then 50 – 100mcg/kg every hour PRN. Some patients may require dosing more frequently as this population is highly variable.

ANALGESICS

Agent	Adult Dosage	Pediatric Dosage
Morphine	2-20mg IV every 4 hours PRN	0.05-0.2mg/kg IV/IM/SUBQ every 1-4 hours
Sublimaze (fentanyl)	50-100mcg IM/IV; doses may be repeated as tolerated	1-2mcg/kg IM or slow IV. May be repeated at 30-60 minute intervals
Fentanyl for sedation maintenance in mechanically-ventilated patients: A loading dose of 1—2 mcg/kg IV is usually given, followed by a continuous IV infusion of 1—2 mcg/kg/hour. Titrate as needed to desired response. Alternatively, lower infusion rates of 25—50 mcg/hour (e.g., 0.5 mcg/kg/hour) can be initiated and the dose titrated upward, as needed.		

NEUROLEPTICS

Agent	Adult Dosage	Pediatric Dosage
Haldol (haloperidol)	2 – 5 mg IM q 4 – 8 hours; Haldol can be given IM on any floor, but IV only in ER and ICU. For intravenous Haldol, see page 30 of this book.	1 – 3mg PO q4 – 8 hours up to a maximum of 0.15mg/kg/day. Haldol IM NOT RECOMMENDED in patients < 6 years old.

Intravenous Antihypertensives

Lopressor (Metoprolol)

Dosing: 2.5 – 5 mg (may be repeated every 5 minutes up to a MAXIMUM total of 15mg)

- Administer by slow, direct IV push over a period of at least 2 minutes.
- Monitor blood pressure, heart rate and ECG during IV administration.

Normodyne (Labetalol)

Dosing: 10 – 20 mg (May titrate up to doses of 80 mg)

- Maximum cumulative dose: 300mg
- Patients must be kept in a supine position during IV administration.
- No dilution necessary.
- Inject slowly over a 2-minute period at intervals of 10 minutes.
- Monitor blood pressure before and at 5-minute intervals after each injection.

Vasotec (Enalaprilat)

Dosing: 0.625 – 1.25 mg IV q6 hours (may be titrated q6 up to a MAX of 5mg)

- Administer by slow, direct IV push over a period of at least 5 minutes.
- May be administered IV infusion or diluted in up to 50 ml saline or dextrose.
- Initial BP reduction occurs in 15 minutes; full response may not occur for up to 4 hours after dose

Apresoline (Hydralazine)

• Dosing: 5 – 20 mg IV q4-6 hours OR 10 – 50 mg IM q4-6 hours.

Note different doses between IM and IV

- IV hydralazine should be given at a rate of no greater than 10 mg per minute.
- Blood pressure and pulse should be monitored frequently.

Inderal (Propranolol)

Dosing:

Adult: 1 – 3 mg IV (give no faster than 1mg/minute). A Second dose may be given after 2 – 3 minutes if needed. Subsequent doses may give q 4 – 6 hours.

Pediatric: 10 – 20 mcg/kg (give by IV infusion over 10 minutes)

- No dilution necessary for adults
- Monitor ECG and central venous pressure during IV administration.

Isoptin (Verapamil)

• Dosing: (For PSVT's) 5 – 10 mg IV over at least 2 minutes (3 minutes in geriatric patients).

- If inadequate response seen after 30 minutes, may give additional 10mg
- No dilution necessary
- Monitor blood pressure, heart rate and ECG during IV administration.

Radiocontrast Allergy Premedication

If a patient has an allergy to radiocontrast, but still must have it, the following regimen may be used to prevent allergic reactions.

Give **EACH** of the following

1. Prednisone 50mg 13, 7, and 1 hours before procedure.
2. Benadryl 50mg PO/IM 1 hour before the procedure.
3. Ephedrine 50mg PO/IM 1 hour before the procedure.

***Ephedrine may be omitted if patient has angina, arrhythmias, or hypertension.

Acetadote / Mucomyst (acetylcysteine)

Indication: Tylenol overdose

If patient's acetaminophen level falls above "possible toxicity line" they should receive treatment. The line connects at 150mcg/ml at 4 hours and 50mcg/ml at 12 hours following first order elimination. The following concentrations are the concentrations of the toxicity line for the given time post ingestion. If the levels are at or above these levels, the patient should be treated for acetaminophen toxicity.

- Hour 4: 150mcg/ml
- Hour 5: 131mcg/ml
- Hour 6: 114mcg/ml
- Hour 7: 100mcg/ml
- Hour 8: 87mcg/ml
- Hour 9: 76mcg/ml
- Hour 10: 66mcg/ml
- Hour 11: 58mcg/ml
- Hour 12: 50mcg/ml

Dosing Regimen:

Acetadote (IV): 150mg/kg in 200ml D5W over 15 minutes, then 50mg/kg in 500ml D5W over 4 hours, then 100mg/kg in 1000ml D5W over 16 hours

Mucomyst (PO): 140mg/kg once, then 70mg/kg q4 hours X 17 doses (Dilute with juice or coke: 3 ml per every ml of Mucomyst)

Dosing Chart: (Acetadote on the left side and PO Acetylcysteine on the right side)

Patient Weight (kg)	Bag #1 (mg) (IV)	Bag #1 (ml/hr) (IV)	Bag #2 (mg) (IV)	Bag #2 (ml/hr) (IV)	Bag #3 (mg) (IV)	Bag #3 (ml/hr) (IV)	140mg/kg (mg) (PO)	140mg/kg (ml of Acetylcysteine 20%) (PO)	70mg/kg (mg) (PO)	70mg/kg (ml of Acetylcysteine 20%) (PO)
45	6750	935	2250	128	4500	64	6300	31.5	3150	15.8
50	7500	950	2500	128	5000	64	7000	35.0	3500	17.5
55	8250	965	2750	128	5500	64	7700	38.5	3850	19.3
60	9000	980	3000	129	6000	64	8400	42.0	4200	21.0
65	9750	995	3250	129	6500	65	9100	45.5	4550	22.8
70	10500	1010	3500	129	7000	65	9800	49.0	4900	24.5
75	11250	1025	3750	130	7500	65	10500	52.5	5250	26.3
80	12000	1040	4000	130	8000	65	11200	56.0	5600	28.0
85	12750	1055	4250	130	8500	65	11900	59.5	5950	29.8
90	13500	1070	4500	131	9000	65	12600	63.0	6300	31.5
95	14250	1085	4750	131	9500	65	13300	66.5	6650	33.3
100	15000	1100	5000	131	10000	66	14000	70.0	7000	35.0
105	15750	1115	5250	132	10500	66	14700	73.5	7350	36.8
110	16500	1130	5500	132	11000	66	15400	77.0	7700	38.5
115	17250	1145	5750	132	11500	66	16100	80.5	8050	40.3
120	18000	1160	6000	133	12000	66	16800	84.0	8400	42.0
125	18750	1175	6250	133	12500	66	17500	87.5	8750	43.8
130	19500	1190	6500	133	13000	67	18200	91.0	9100	45.5

Acetadote / Mucomyst (continued)

Adverse reactions: Tachycardia (generally mild), gastrointestinal disorders, nausea/vomiting, immune system disorders, respiratory disorders, injection site reactions

Drug Interactions: Activated charcoal (may absorb Oral Acetylcysteine; see nursing considerations) and Nitrates (acetylcysteine may enhance effect of nitrates)

Contraindications: None

Nursing Considerations: If giving activated charcoal with gastric lavage, oral Acetylcysteine should probably be given after lavage to decrease the chance of decreased Acetylcysteine absorption. However, if necessary, the two may be given together. (Acetylcysteine absorption may vary from 75-100% of expected if given with activated charcoal) Due to the terrible taste of Mucomyst, it should be diluted with Coca-Cola (3ml per every ml of Mucomyst).

Activase (TPA)

Indication: Thrombotic Stroke (see bottom of page for occluded catheters)

Standard Concentration: 1 mg/ml

Dosing:

0.9 mg/kg (up to a maximum of 90mg): 10% of dose (0.09mg/kg) is to be given as a bolus over 1 minute followed by the other 90% (0.81mg/kg) over 1 hour

Dosing Chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
0.09mg/kg Bolus (ml)	4.1	4.5	5.0	5.4	5.9	6.3	6.8	7.2	7.7	8.1	8.6	9	9	9	9	9
0.81mg/kg Infusion (rate)	36.5	40.5	44.6	48.6	52.7	56.7	60.8	64.8	68.9	72.9	77.0	81	81	81	81	81

Adverse effects: bleeding & arrhythmias not associated with haemodynamic compromise

Drug interactions: Aminocaproic acid, aprotinin, and tranexamic acid can antagonize the effects of TPA. Also, TPA increases the effects of anticoagulants (e.g. heparin, warfarin, aspirin, etc.)

Contraindications: Bleeding/hemorrhage, intracranial mass, increased intracranial pressure, aneurysm

Nursing considerations:

1. Continuous monitoring of HR, BP, GCS, Neuro Checks
2. Monitor Labs
3. Monitor for bleeding: urine, stool, internal, gums etc...
4. Establish onset of stroke: Signs and Symptoms less than 3 hours prior to administration and obtain CT of the head, consult neurology.

Intracatheter instillation reestablishing patency of an occluded IV catheter:

Dosing: Instill 2mg/2ml into the occluded catheter. After 30 minutes of dwell time, assess catheter function by attempting to aspirate blood. If the catheter is not functional after 30 minutes, allow the solution to remain for an additional 90 minutes (120 minutes of total dwell time) and assess catheter function by attempting to aspirate blood and catheter contents. If catheter function is not restored 2 hours after the first dose, a second dose may be instilled. In patients weighing < 30 KG, give 110% of the internal lumen volume of the catheter, not to exceed 2mg/2ml.

Nursing Considerations:

- Consider other reasons for catheter dysfunction, such as catheter malposition, mechanical failure, constriction by a suture, and lipid deposits or drug precipitates within the lumen, prior to treatment with TPA.
- Avoid vigorous suction during attempts to determine catheter occlusion to prevent damage to the vascular wall or collapse of soft-walled catheters.
- Excessive pressure should be avoided when TPA is instilled into the catheter. Such force could cause rupture of the catheter or expulsion of the clot into the circulation.

Adenocard (adenosine)

Indication: Paroxysmal Supraventricular Tachycardia (PSVT)

Dosing:

6 mg rapid IV bolus over 1-3 seconds followed by 20 ml 0.9% NS bolus. If tachycardia persists, may give 12 mg x 2 more doses. (each dose separated by 1-2 minutes) Each dose should be followed by 20 ml 0.9% NS. Some experts recommend reduced initial dose of adenosine (e.g. 3mg in adults).

Adverse effects: Temporary Asystole, Hypotension, Bradycardia, and Flushing

Drug interactions:

1. Caffeine and theophylline block effects of adenosine, and larger doses may be required.
2. Adenosine used in combination with Digoxin and verapamil may have additive depressant effects on SA and AV nodes, and therefore, this combination should be used with caution.
3. Tegretol increases the degree of heart block caused by adenosine.
4. Persantine blocks the metabolism of adenosine and enhances its effect. Dose reduction may be necessary.

Contraindications: Atrial fibrillation, Atrial flutter, AV block, Sick sinus syndrome, and Ventricular tachycardia

Nursing considerations:

1. Monitor Continuous ECG and blood pressure
2. Adenosine has a very short half life (less than 5 seconds)

Aminophylline Drip (theophylline)

Indication: Asthma / Bronchospasm

400mg of Theophylline = 500mg of Aminophylline

Dosing is based on Aminophylline; therefore 400mg of Theophylline in 500ml is treated as a 1mg/ml drip

Aminophylline mixed in 0.9% NaCl is stable for 24 hours

Theophylline is available as a premix and its expiration will be labeled on the bag.

Dosing: (Doses are based on Aminophylline, NOT Theophylline)

Drips are 1mg/ml, so mg/kg/hr = ml/kg/hr.

Loading dose (Only load if patient is not taking Theophylline): 6mg/kg over 20-30 minutes

Maintenance Dose:

Age	Dose
1 - 9 years	0.8 mg/kg/hr
9-12 years	0.7 mg/kg/hr
12 - 16 year smoker	0.7 mg/kg/hr
12 - 16 year NON-smoker	0.5 mg/kg/hr (Max 50mg/hour)
Adult smoker	0.7mg/kg/hr
16 - 60 year NON-smoker	0.4mg/kg/hr (Max 50mg/hour)
Elderly	0.3mg/kg/hr
Cor Pulmonale Pt.	0.2 mg/kg/hr (Max 17mg/hour)
CHF or Liver Failure	0.25mg/kg/hr
Renal insufficiency Reduce above doses by 50%	

Adverse Reactions: Seizures, Dizziness/Restlessness, Palpitations, Sinus Tachycardia, Hypotension, Hypokalaemia, Metabolic acidosis, and Nausea/Vomiting.

Drug Interactions: Sodium phosphate and Ketamine may lower seizure threshold of theophylline. Cimetidine, Isoniazid, Mexiletine, Luvox, Macrolide antibiotics (e.g. Biaxin & erythromycin) may increase theophylline level due to enzyme inhibition. Barbiturates, carbamazepine, ethotoin, phenytoin or fosphenytoin, primidone, and rifampin may decrease theophylline level due to enzyme induction.

Nursing Considerations:

1. Doses should be calculated based on ideal body weight
2. Do not exceed 25 mg/min (Aminophylline) (1500ml/hr)
3. Monitor HR, BP, RR
4. IV administration can cause burning
5. Propranolol may cause Bronchospasms
6. Monitor serum levels (Therapeutic = 10 – 15 mcg/ml)

Antizol (fomepizole)

Indication: Ethylene glycol toxicity

Standard Concentration: Dilute total dose in 100ml 0.9% NaCl

Stable for 24 hours

Run over 30 minutes

Dosing:

First dose: 15mg/kg.

Then 10mg/kg q12 x 4 doses.

Then 15mg/kg q12 until ethylene glycol or methanol level is less than 20mg/dl, and patient is asymptomatic, and patient has normal arterial blood pH value (7.35-7.44, this value may vary slightly from one facility to another).

Dosing Chart:

Weight (kg)	15mg/kg (loading dose) (mg)	10mg/kg (next 4 doses) (mg)	15mg/kg (thereafter) (mg)
45	675	450	675
50	750	500	750
55	825	550	825
60	900	600	900
65	975	650	975
70	1050	700	1050
75	1125	750	1125
80	1200	800	1200
85	1275	850	1275
90	1350	900	1350
95	1425	950	1425
100	1500	1000	1500
105	1575	1050	1575
110	1650	1100	1650
115	1725	1150	1725
120	1800	1200	1800
125	1875	1250	1875
130	1950	1300	1950

Adverse reactions: Headache, nausea, dizziness, rash, metallic taste, abnormal smell, seizures.

Drug Interactions: Ethanol decreases elimination of Antizol by approximately 50%.

Nursing Considerations: Watch for calcium oxalate crystals in the urine. It is indicative of high ethylene glycol levels

ARGATROBAN PROTOCOL FOR HIT

Discontinue: Heparin, Heparin Flushes, Enoxaparin, Warfarin, _____.

Patient weight (actual body weight in kg) _____ (round to nearest 10 kg).

Baseline labs: aPTT, PT/INR, CMP, HCT, and platelet count.

Standard concentration 1000 mcg/cc Argatroban (250 mg/250 ml 0.9% NaCl)

Baseline aPTT: _____

Child Pugh Score: _____

aPTT Target Range: _____ (1.5 x baseline aPTT) to _____ (3 x baseline aPTT) (Do not exceed 100 seconds)

- Normal Hepatic Function: (Child-Pugh Score \leq 6)

Initial dose: 2 mcg/kg/minute IV infusion
(round dose to nearest 10 kg)

- Moderate Hepatic Impairment: (Child-Pugh Score $>$ 6)

Initial dose: 0.5 mcg/kg/minute IV infusion (round dose to nearest 10 kg) DO NOT USE in patients with ALT/AST elevations greater than 3 times the upper limits of normal. (consider Recludan)

Dosage Adjustments:

aPTT result	Normal Dosing Adjustment	Child-Pugh score $>$ 6 Dosing Adjustment
aPTT $<$ goal range	Increase by 0.5 mcg/kg/minute	Increase by 0.25 mcg/kg/minute
aPTT within goal range	No Change	No Change
aPTT $>$ goal range	Decrease by 0.5 mcg/kg/minute	Decrease by 0.25 mcg/kg/minute
DO NOT EXCEED aPTT of 100 seconds		

MONITORING: ALL aPTTs ARE TO BE RUN STAT.

Obtain aPTT 2 hours after start of infusion and adjust dose as ordered below.

Check aPTT 2 hours after each dose adjustment.

Check aPTT daily after aPTT in therapeutic range X2 consecutive readings.

Platelet count daily while on Argatroban.

ANY ADJUSTMENTS to infusion to be documented per physician order.

Monitor for signs and symptoms of bleeding.

Avoid IM injections while Argatroban infusing.

Physician signature: _____ Date: _____

EMORY EASTSIDE

Patient name: _____

MEDICAL CENTER

FAX TO PHARMACY

Child-Pugh Score			
Measure	1 point	2 points	3 points
Bilirubin	$<$ 2	2-3	$>$ 3
Albumin	$>$ 3.5	2.8-3.5	$<$ 2.8
INR	$<$ 1.7	1.71-2.20	$>$ 2.20
Ascites	None	Suppressed with medication	Refractory
Hepatic encephalopathy	None	Grade I-II (or suppressed with medication)	Grade III-IV (or refractory)

Ativan (lorazepam)

Indication: Sedation in critical care setting

Standard Concentration: 0.2mg/ml

Dosing:

Bolus: 2mg IV over 1 minute

Drip: Initiate at 1mg/hr and adjust dose by 1mg/hr every 30 minutes until desired level of sedation is achieved.

Dosage range: 0.01-0.1 mg/kg/hr

Adverse effects: Propylene glycol toxicity which can include lactic acidosis, hyperosmolarity, hypotension, and acute tubular necrosis

Nursing considerations: Monitor BP and level of sedation every 15 minutes while titrating or adjusting the dose then every 30 minutes while on maintenance dose.

Ramsay Level of Sedation Scale	
Clinical Score	Level of Sedation Achieved
6	Asleep, no response
5	Asleep, sluggish response to light glabellar tap or loud auditory stimulus
4	Asleep, but with brisk response to light glabellar tap or loud auditory stimulus
3	Patient responds to commands
2	Patient cooperative, oriented, and tranquil
1	Patient anxious, agitated, or restless

Brevibloc (esmolol)

Indication: Supraventricular Tachyarrhythmia

Standard concentration: 10mg/ml (premixed bag)

Dosing:

Bolus: 500mcg/kg over 1 minute (Use with caution)

Maintenance: 50mcg/kg/min, increase by 50mcg/kg/min every 4-5 minutes up to 200mcg/kg/min.

Maximum dose is 300mcg/kg/min, but doses greater than 200mcg/kg/min are associated with increased adverse effects.

Calculation: 50mcg/kg/min = 0.3ml/kg/hour at 10mg/ml concentration

Dosing Chart:

Patient Weight (kg)	500 mcg/kg bolus (ml)	50mcg /kg/min (ml/hr)	100mcg /kg/min (ml/hr)	150mcg /kg/min (ml/hr)	200mcg /kg/min (ml/hr)	250mcg /kg/min (ml/hr)	300mcg/ kg/min (ml/hr)
45	2.3	13.5	27.0	40.5	54.0	67.5	81.0
50	2.5	15.0	30.0	45.0	60.0	75.0	90.0
55	2.8	16.5	33.0	49.5	66.0	82.5	99.0
60	3.0	18.0	36.0	54.0	72.0	90.0	108.0
65	3.3	19.5	39.0	58.5	78.0	97.5	117.0
70	3.5	21.0	42.0	63.0	84.0	105.0	126.0
75	3.8	22.5	45.0	67.5	90.0	112.5	135.0
80	4.0	24.0	48.0	72.0	96.0	120.0	144.0
85	4.3	25.5	51.0	76.5	102.0	127.5	153.0
90	4.5	27.0	54.0	81.0	108.0	135.0	162.0
95	4.8	28.5	57.0	85.5	114.0	142.5	171.0
100	5.0	30.0	60.0	90.0	120.0	150.0	180.0
105	5.3	31.5	63.0	94.5	126.0	157.5	189.0
110	5.5	33.0	66.0	99.0	132.0	165.0	198.0
115	5.8	34.5	69.0	103.5	138.0	172.5	207.0
120	6.0	36.0	72.0	108.0	144.0	180.0	216.0
125	6.3	37.5	75.0	112.5	150.0	187.5	225.0
130	6.5	39.0	78.0	117.0	156.0	195.0	234.0

Adverse reactions: hypotension, diaphoresis, injection site reactions, nausea

Contraindications: acute bronchospasm, AV block, bradycardia, cardiogenic shock, pulmonary edema, and sick sinus syndrome

Drug Interactions: diltiazem, furosemide, sodium bicarbonate, and thiopental are all incompatible

Nursing considerations:

1. Use with caution in impaired renal function, diabetes, Bronchospasms
2. For infusion only; DO NOT GIVE IV PUSH
3. Monitor: ECG and BP continuously
4. Recommended for short term use (up to 48 hours)

Cardene (nicardipine)

Indication: Stroke patients refractory to labetalol

Standard Concentration: 0.1mg/ml

Stable for 24 hours at room temperature.

Dosing:

IV dosing as a substitute for PO therapy

20mg po q8 is equivalent to 0.5mg/hr

30mg po q8 is equivalent to 1.2mg/hr

40mg po q8 is equivalent to 2.2mg/hr

Patients who have never had Cardene PO

Initiate at 5mg/hr, may increase by 2.5mg/hr every 15 minutes up to a maximum of 15mg/hr. Once blood pressure goal has been reached, decrease dose to 3mg/hr.

If more rapid pressure reduction is required, rate increases may be done every 5 minutes instead of every 15 minutes.

Dosing Chart:

Dose: (mg/hr)	0.5	1.2	2.2	3	5	7.5	10	12.5	15
Rate: (ml/hr)	5	12	22	30	50	75	100	125	150

Adverse effects: Headache, N/V, Hypotension, Tachycardia

Drug interactions: Cardene may increase levels of medications metabolized by CYP3A4.

Contraindications: aortic stenosis, dihydropyridine hypotension, hypersensitivity (Norvasc, Plendil, Dynacirc, Sular, Procardia, and Cardene)

Nursing considerations: Monitor blood pressure and heart rate.

Cardizem (diltiazem)

Indications: Paroxysmal Supraventricular Tachycardia (PSVT) and Atrial Fibrillation and Flutter

Standard Concentration: 1mg/ml

Stable for 24 hours at room temperature or under refrigeration.

Infusion rates in ml/hr is the same as mg/hr because concentration is 1mg/ml.

In patients with low body weights (less than 80kg), bolus doses should be based on mg/kg doses.

Otherwise, use the 20 or 25mg doses.

Dosing:

Paroxysmal Supraventricular Tachycardia (PSVT)

20mg (or 0.25mg/kg if < 80kg) dose given over 2 minutes

If no conversion to normal sinus rhythm, may give 25mg (or 0.35mg/kg) may be given 15 minutes after the initial dose.

Atrial Fibrillation and Flutter

20mg (or 0.25mg/kg if < 80kg) dose given over 2 minutes

If desired reduction in ventricular rate does not occur, may give 25mg (or 0.35mg/kg) may be given 15 minutes after the initial dose.

If continued reduction in ventricular rate is required, initiate infusion at 10mg/hr. Infusion rate may be increased by increments of 5mg/hr up to 15mg/hr. Maximum rate is 15mg/hr. Some patients may require lower doses such as 5mg/hr.

Adverse effects: Bradycardia, AV block, worsen CHF, itching or burning at injection site, vasodilation, flushing, hypotension, swelling and/or edema, headache, dizziness, muscle weakness

Drug Interactions:

1. Diltiazem can increase digoxin concentrations
2. Diltiazem can increase cyclosporine concentrations and should be used with caution in patients stabilized on cyclosporine.
3. Combination of diltiazem and beta-blockers can cause CHF, excessive bradycardia, hypotension, cardiac conduction, abnormalities, or heart block.

Contraindications: AV block, hypotension, sick sinus syndrome, Wolff-Parkinson-White syndrome, and Lown-Ganong-Levine syndrome.

Nursing Considerations: Monitor: BP, HR, RR, ECG

Cerebyx (fosphenytoin)

Indication: Status Epilepticus / Seizures
Stable for greater than 24 hours

Dosing: 1000mg bolus appropriate for seizing patient, but dosing should be individualized.

Adverse effects: Hypotension, V. Fib, Drowsiness, Dizziness, Headache, Leukopenia, Thrombocytopenia, Stevens Johnson Syndrome: Rash

Drug Interactions: Dosage for some HIV medications may need to be increased for a patient on phenytoin as it is an inducer.

Contraindications: Adams-Stokes syndrome, agranulocytosis, AV block, bone marrow suppression, bradycardia, bundle branch block, and hydantoin hypersensitivity

Nursing Considerations:

1. Dosing is based on phenytoin equivalents (PE). Thus 1000mg of Cerebyx PE = 1000mg of phenytoin sodium.
2. Medication should be diluted to a concentration of 1.5 – 25 mg PE/ml
3. IV rate should not exceed 150mg PE/min
4. Phenytoin therapeutic level 10 – 20mcg/ml
5. Monitor BP, HR, and mental status

Cordarone (amiodarone)

Indications: Ventricular Fibrillation (Cardiac Arrest) & Unstable Ventricular Tachycardia

Must be mixed in glass or Aviva container (a non-latex plastic container that does not contain PVC, DEHP, or other plasticizers) if infusion exceeds 2 hours (i.e. a bolus can be put in a bag)

Stable for 5 days at room temperature.

Standard Bolus: 150mg in 100ml of Dextrose 5% (1.5mg/ml).

Standard Infusion concentration: 1.8mg/ml in Dextrose 5% mixed in a glass bottle or Aviva container

Dosing:

150mg over 10 minutes (15mg/min) bolus (Rate = 600ml/hr)(1.5mg/ml),

then 1mg/min for 6 hours (Rate = 33.3ml/hr) (1.8mg/ml),

then 0.5mg/min (Rate = 16.7ml/hr) (1.8mg/ml)

In the event of breakthrough ventricular fibrillation, the patient may be re-bolused at 150mg over 10 minutes (15mg/min)

Adverse reactions: hypotension, nausea/vomiting, alveolitis, pulmonary fibrosis, interstitial pneumonitis, hypo- or hyperthyroidism, cardiac arrhythmias

Drug interactions: Numerous; any medication that may prolong the QT interval

Contraindications: AV Block, Benzyl alcohol hypersensitivity, cardiogenic shock, sick sinus syndrome, and *iodine hypersensitivity*

Nursing Considerations:

1. Monitor ECG, HR, BP
2. Use a 0.22 micron filter
3. Use glass bottle for continuous infusion. A bag may be used for the bolus as long as it is given within one hour of mixing.

Corlopam (fenoldopam)

Indication: Short term (up to 48 hours) for management of severe hypertension including malignant hypertension with deteriorating end organ function

Standard Concentration: 40mcg/ml

Stable for 24 hours at room temperature

Dosing:

Rate initiation should be based on one of the following dosing charts

Initial doses of 0.03-0.1mcg/kg/min are associated with less reflex tachycardia and are preferred to higher initial doses (e.g. 0.3mcg/kg/min)

DO NOT USE A BOLUS!!!!

Most of the effects of a given infusion rate are attained by 15 minutes. Therefore, doses should be titrated no sooner than every 15 minutes.

Recommended increments for titration are 0.05-0.1mcg/kg/min

Mild to Moderate Hypertensive Patients

Time Point and Mean Change From Time Zero +/- SE	Infusion Rate (mcg/kg/min)			
	0.04 n=7	0.1 n=7	0.4 n=5	0.8 n=6
15 Minutes of Infusion				
Systolic BP	-15 ± 6	-19 ± 8	-14 ± 4	-24 ± 6
Diastolic BP	-5 ± 3	-12 ± 4	-15 ± 3	-20 ± 4
Heart Rate	+3 ± 2	+5 ± 1	+16 ± 3	+19 ± 3
30 Minutes of Infusion				
Systolic BP	-17 ± 6	-18 ± 6	-14 ± 8	-26 ± 6
Diastolic BP	-7 ± 3	-16 ± 4	-14 ± 3	-20 ± 2
Heart Rate	+3 ± 2	+10 ± 1	+18 ± 3	+23 ± 3
1 Hour of Infusion				
Systolic BP	-22 ± 7	-22 ± 7	-26 ± 9	-22 ± 9
Diastolic BP	-9 ± 2	-18 ± 4	-19 ± 4	-21 ± 1
Heart Rate	+5 ± 2	+12 ± 3	+19 ± 4	+25 ± 4
4 Hours of Infusion				
Systolic BP	-16 ± 9	-31 ± 15	-22 ± 11	-25 ± 7
Diastolic BP	-8 ± 4	-19 ± 9	-25 ± 3	-20 ± 1
Heart Rate	+6 ± 3	+10 ± 4	+21 ± 2	+27 ± 7
24 Hours of Infusion				
Systolic BP	-23 ± 8	-35 ± 7	-22 ± 6	-23 ± 11
Diastolic BP	-11 ± 5	-23 ± 10	-22 ± 5	-13 ± 3
Heart Rate	+5 ± 3	+13 ± 2	+17 ± 4	+15 ± 3
48 Hours of Infusion				
Systolic BP	-31 ± 6	-22 ± 8	-9 ± 6	-14 ± 10
Diastolic BP	-10 ± 6	-9 ± 7	-9 ± 2	-9 ± 3
Heart Rate	0 ± 4	+1 ± 4	+12 ± 3	+8 ± 3

Hypertensive Emergency Patients

Time Point and Mean Change From Time Zero +/- SE	Infusion Rate (mcg/kg/min)			
	0.04 n=7	0.1 n=7	0.4 n=5	0.8 n=6
Pre-Infusion Baseline				
Systolic BP	210 ± 21	208 ± 26	205 ± 24	211 ± 17
Diastolic BP	136 ± 16	135 ± 11	133 ± 14	136 ± 15
Heart Rate	87 ± 20	84 ± 14	81 ± 19	80 ± 14
15 Minutes of Infusion				
Systolic BP	-5 ± 4	-7 ± 4	-16 ± 4	-19 ± 4
Diastolic BP	-5 ± 3	-8 ± 3	-12 ± 2	-21 ± 2
Heart Rate	-2 ± 3	+1 ± 1	+2 ± 1	+11 ± 2
30 Minutes of Infusion				
Systolic BP	-6 ± 4	-11 ± 4	-21 ± 3	-16 ± 4
Diastolic BP	-10 ± 3	-12 ± 3	-17 ± 3	-20 ± 2
Heart Rate	-2 ± 3	-1 ± 1	+3 ± 2	+12 ± 3
1 Hour of Infusion				
Systolic BP	-5 ± 3	-9 ± 4	-19 ± 4	-22 ± 4
Diastolic BP	-8 ± 3	-13 ± 3	-18 ± 2	-23 ± 2
Heart Rate	-1 ± 3	0 ± 2	+3 ± 2	+11 ± 3
4 Hours of Infusion				
Systolic BP	-14 ± 4	-20 ± 5	-23 ± 4	-37 ± 4
Diastolic BP	-12 ± 3	-18 ± 3	-21 ± 3	-29 ± 3
Heart Rate	-2 ± 4	0 ± 2	+4 ± 2	+11 ± 2

Corloпам (Continued)

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
0.05mcg/kg/min (ml/hr)	3.4	3.8	4.1	4.5	4.9	5.3	5.6	6.0	6.4	6.8	7.1	7.5	7.9	8.3	8.6	9.0	9.4	9.8
0.1mcg/kg/min (ml/hr)	6.8	7.5	8.3	9.0	9.8	10.5	11.3	12.0	12.8	13.5	14.3	15.0	15.8	16.5	17.3	18.0	18.8	19.5
0.15mcg/kg/min (ml/hr)	10.1	11.3	12.4	13.5	14.6	15.8	16.9	18.0	19.1	20.3	21.4	22.5	23.6	24.8	25.9	27.0	28.1	29.3
0.2mcg/kg/min (ml/hr)	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0	31.5	33.0	34.5	36.0	37.5	39.0
0.25mcg/kg/min (ml/hr)	16.9	18.8	20.6	22.5	24.4	26.3	28.1	30.0	31.9	33.8	35.6	37.5	39.4	41.3	43.1	45.0	46.9	48.8
0.3mcg/kg/min (ml/hr)	20.3	22.5	24.8	27.0	29.3	31.5	33.8	36.0	38.3	40.5	42.8	45.0	47.3	49.5	51.8	54.0	56.3	58.5
0.35mcg/kg/min (ml/hr)	23.6	26.3	28.9	31.5	34.1	36.8	39.4	42.0	44.6	47.3	49.9	52.5	55.1	57.8	60.4	63.0	65.6	68.3
0.4mcg/kg/min (ml/hr)	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0	51.0	54.0	57.0	60.0	63.0	66.0	69.0	72.0	75.0	78.0
0.45mcg/kg/min (ml/hr)	30.4	33.8	37.1	40.5	43.9	47.3	50.6	54.0	57.4	60.8	64.1	67.5	70.9	74.3	77.6	81.0	84.4	87.8
0.5mcg/kg/min (ml/hr)	33.8	37.5	41.3	45.0	48.8	52.5	56.3	60.0	63.8	67.5	71.3	75.0	78.8	82.5	86.3	90.0	93.8	97.5
0.55mcg/kg/min (ml/hr)	37.1	41.3	45.4	49.5	53.6	57.8	61.9	66.0	70.1	74.3	78.4	82.5	86.6	90.8	94.9	99.0	103.1	107.3
0.6mcg/kg/min (ml/hr)	40.5	45.0	49.5	54.0	58.5	63.0	67.5	72.0	76.5	81.0	85.5	90.0	94.5	99.0	103.5	108.0	112.5	117.0
0.65mcg/kg/min (ml/hr)	43.9	48.8	53.6	58.5	63.4	68.3	73.1	78.0	82.9	87.8	92.6	97.5	102.4	107.3	112.1	117.0	121.9	126.8
0.7mcg/kg/min (ml/hr)	47.3	52.5	57.8	63.0	68.3	73.5	78.8	84.0	89.3	94.5	99.8	105.0	110.3	115.5	120.8	126.0	131.3	136.5
0.75mcg/kg/min (ml/hr)	50.6	56.3	61.9	67.5	73.1	78.8	84.4	90.0	95.6	101.3	106.9	112.5	118.1	123.8	129.4	135.0	140.6	146.3
0.8mcg/kg/min (ml/hr)	54.0	60.0	66.0	72.0	78.0	84.0	90.0	96.0	102.0	108.0	114.0	120.0	126.0	132.0	138.0	144.0	150.0	156.0

Adverse reactions: headache, flushing, nausea, hypotension, reflex tachycardia

Drug interactions: Beta blockers (high risk of hypotension), Metoclopramide (peripherally acting dopamine agonists may inhibit blood pressure effects of Corloпам), MAOI's (MAOI's may cause additive hypotensive effects of Corloпам)

Precautions: Patients with sulfite allergy, glaucoma

Nursing Considerations:

1. If hypotension occurs, discontinue the Corloпам
2. Administer by IV infusion only (no bolus)
3. Titrate up or down every 15 minutes
4. Monitor vitals and blood pressure frequently
5. Monitor cardiac rhythm, labs
6. Onset of effect is 15 minutes, and it peaks in 20 minutes.

Cortrosyn (ACTH, synthetic)

Indication: Diagnosis of Adrenocortical Insufficiency

High Dose ACTH Stimulation:

Obtain a baseline cortisol level. Dilute 0.25mg of Cortrosyn (Cosyntropin or synthetic ACTH) vial with 1ml of 0.9% NaCl. Give IV push over 2 minutes. Flush the line after administering the dose. Normal patients will have an increase of at least 7mcg/dL 30 minutes after receiving Cortrosyn. If the level is taken 60 minutes after receiving Cortrosyn, there should be an increase of at least 11mcg/dL. The time of day that the test is given does not matter. If you get a subnormal Cortrosyn test result, you must determine whether the patient has primary or secondary adrenocortical insufficiency. The manufacturer of Cortrosyn recommends that patients with subnormal Cortrosyn test results be given 40 units of repository corticotropin injection IM twice daily for 4 days or 60 units twice daily for 3 days, followed by a second Cortrosyn test. In patients with primary adrenocortical insufficiency, there will be little or no increase in plasma cortisol concentrations following the second Cortrosyn test; patients with secondary adrenocortical insufficiency will have higher or even normal plasma cortisol concentrations.

Low Dose ACTH Stimulation:

Low dose ACTH stimulation is done the same as high dose except the dose is 1mcg rather than 250mcg (0.25mg). High dose has been the standard test, but low dose has come out in just the last few years. The dose must be prepared by the pharmacy. A 250mcg vial will be diluted in 250ml, and 1ml (1mcg) will be drawn and delivered to the floor for administration. It is very important to flush the line after the dose to ensure that the entire dose was delivered. The advantage of the low dose stimulation test is that it gives fewer false negatives than the 250mcg dose. However, the additional patients that it identifies tend to be sicker and may not respond to treatment. (Yaegashi M, Boujoukos AJ. The low-dose ACTH test in the ICU: not ready for prime time. Crit Care. 2006; 10(4): 313.)

Corvert (ibutilide)

Indication: Rapid conversion of recent onset atrial fibrillation or atrial flutter

Dosing:

Patients \geq 60kg: 1mg (10ml)
Patients $<$ 60kg: 0.01mg/kg (0.1ml/kg)
Dose should be given IV push over 10 minutes

Adverse reactions: tachycardia, extrasystole, AV block, bundle branch block

Contraindications: QT prolongation, torsade de pointes, ventricular arrhythmias, ventricular tachycardia

Precautions:

1. Do not give class I agents (Disopyramide, Procainamide, Quinidine) within 4 hours after Corvert infusion
2. Do not give class III agents (Sotalol, Amiodarone) within 4 hours after Corvert infusion
3. Use with caution in CHF, low ejection fraction, recent MI, prolonged QT

Nursing considerations:

1. Monitor Digoxin Levels
2. Phenothiazines, antidepressants, antihistamines can prolong Qt intervals
3. Discontinue Covert as soon as the arrhythmia is terminated or if VT begins, or if prolonged QT
4. Continuous ECG monitoring is required
5. Have defib/cardioversion available

Dilantin (phenytoin)

Indications: Status Epilepticus / Seizures

Stable for 4 hours

Dosing: 1000mg bolus appropriate for seizing patient, but dosing should be individualized.

Adverse effects: Phlebitis, Hypotension, V. Fib, Drowsiness, Dizziness, Headache, Leukopenia, Thrombocytopenia, and Stevens Johnson Syndrome: Rash

Drug Interactions: Dosage for some HIV medications may need to be increased for a patient on phenytoin as it is an inducer.

Contraindications: Adams-Stokes syndrome, agranulocytosis, AV block, bone marrow suppression, bradycardia, bundle branch block, jaundice, methemoglobinaemia, and hydantoin hypersensitivity

Nursing Considerations:

1. Administer IV slow (50mg/min)
2. Do not mix with DEXTROSE (will precipitate)
3. Flush IV tubing with saline before and after giving phenytoin.
4. Monitor BP, HR, ECG, and mental status
5. Use large veins
6. Monitor blood levels (normal 10-20 mcg/ml)
7. May cause pink/red/brown urine color

Diprivan (propofol)

Indication: Sedation in critical care setting

Standard Concentration: 10mg/ml

Propofol has less variable effect on recovery to consciousness and a quicker recovery than midazolam but a higher incidence of hypotension.

Dosing:

Bolus: In patients LIKELY to develop hypotension & who have residual effects from anesthetic drugs, skip bolus. In patients who are unlikely to develop hypotension, give 10 – 20mg bolus.

Maintenance: Initiate at 5mcg/kg/min.

Titration: Doses may be titrated in increments of 5-10mcg/kg/min every 5 minutes.

Normal maintenance dose for sedation: 5-50mcg/kg/min.

DO NOT EXCEED 100mcg/kg/min. Higher doses are associated with propofol infusion syndrome

Dosing Chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
5 mcg/kg/min (ml/hr)	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	3.0	3.2	3.3	3.5	3.6	3.8	3.9
10 mcg/kg/min (ml/hr)	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9	7.2	7.5	7.8
15 mcg/kg/min (ml/hr)	4.1	4.5	5.0	5.4	5.9	6.3	6.8	7.2	7.7	8.1	8.6	9.0	9.5	9.9	10.4	10.8	11.3	11.7
20 mcg/kg/min (ml/hr)	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6
25 mcg/kg/min (ml/hr)	6.8	7.5	8.3	9.0	9.8	10.5	11.3	12.0	12.8	13.5	14.3	15.0	15.8	16.5	17.3	18.0	18.8	19.5
30 mcg/kg/min (ml/hr)	8.1	9.0	9.9	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18.0	18.9	19.8	20.7	21.6	22.5	23.4
35 mcg/kg/min (ml/hr)	9.5	10.5	11.6	12.6	13.7	14.7	15.8	16.8	17.9	18.9	20.0	21.0	22.1	23.1	24.2	25.2	26.3	27.3
40 mcg/kg/min (ml/hr)	10.8	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8	24.0	25.2	26.4	27.6	28.8	30.0	31.2
45 mcg/kg/min (ml/hr)	12.2	13.5	14.9	16.2	17.6	18.9	20.3	21.6	23.0	24.3	25.7	27.0	28.4	29.7	31.1	32.4	33.8	35.1
50 mcg/kg/min (ml/hr)	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0	31.5	33.0	34.5	36.0	37.5	39.0

Diprivan (Continued)

Adverse effects: hypotension (be careful with rate, see above, and give fluids if occurs), respiratory depression, involuntary movement, injection site pain (This can be decreased by giving in a large vein or giving 1ml of lidocaine 1% 30-120 seconds prior to starting the injection), hyperlipidemia (propofol has the same lipid content as 10% intra lipids)

Drug interactions: MAOI's (patients who have received an MAOI in the previous 10 days have an increased risk of hypotension with Diprivan)

Contraindications: egg hypersensitivity, soya lecithin hypersensitivity; use cautiously in hypotensive patients

Nursing Considerations:

1. Patient must be Intubated and ventilated
2. Monitor: HR, ECG, Pulse Ox, BP
3. Abrupt discontinuation of infusion may result in rapid awakening with agitation, anxiety
4. Discard tubing/bottle after 12 hours (contains lipids)
5. Do not use if emulsion appears separated
6. If hypotension or bradycardia occurs, decrease or stop Diprivan and monitor BP & HR, notify MD
7. Document neuro assessment on awakening

Ramsay Level of Sedation Scale	
Clinical Score	Level of Sedation Achieved
6	Asleep, no response
5	Asleep, sluggish response to light glabellar tap or loud auditory stimulus
4	Asleep, but with brisk response to light glabellar tap or loud auditory stimulus
3	Patient responds to commands
2	Patient cooperative, oriented, and tranquil
1	Patient anxious, agitated, or restless

Dobutamine

Indication: Cardiac decompensation & cardiopulmonary resuscitation

Available in 250ml premix bag of D5W at a concentration of 1mg/ml

Dosing:

Initiate at 0.5-1mcg/kg/min

Normal doses = 2-20 mcg/kg/min

Do NOT exceed 40 mcg/kg/min

Dosing Chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
0.5mcg/kg/min (ml/hr)	1.4	1.5	1.7	1.8	2.0	2.1	2.25	2.4	2.55	2.7	2.9	3	3.15	3.3	3.45	3.6
1mcg/kg/min (ml/hr)	2.7	3	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6	6.3	6.6	6.9	7.2
2mcg/kg/min (ml/hr)	5.4	6	6.6	7.2	7.8	8.4	9	9.6	10.2	10.8	11.4	12	12.6	13.2	13.8	14.4
3mcg/kg/min (ml/hr)	8.1	9	9.9	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18	18.9	19.8	20.7	21.6
4mcg/kg/min (ml/hr)	10.8	12	13.2	14.4	15.6	16.8	18	19.2	20.4	21.6	22.8	24	25.2	26.4	27.6	28.8
5mcg/kg/min (ml/hr)	13.5	15	16.5	18	19.5	21	22.5	24	25.5	27	28.5	30	31.5	33	34.5	36
6mcg/kg/min (ml/hr)	16.2	18	19.8	21.6	23.4	25.2	27	28.8	30.6	32.4	34.2	36	37.8	39.6	41.4	43.2
7mcg/kg/min (ml/hr)	18.9	21	23.1	25.2	27.3	29.4	31.5	33.6	35.7	37.8	39.9	42	44.1	46.2	48.3	50.4
8mcg/kg/min (ml/hr)	21.6	24	26.4	28.8	31.2	33.6	36	38.4	40.8	43.2	45.6	48	50.4	52.8	55.2	57.6
9mcg/kg/min (ml/hr)	24.3	27	29.7	32.4	35.1	37.8	40.5	43.2	45.9	48.6	51.3	54	56.7	59.4	62.1	64.8
10mcg/kg/min (ml/hr)	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72
11mcg/kg/min (ml/hr)	29.7	33	36.3	39.6	42.9	46.2	49.5	52.8	56.1	59.4	62.7	66	69.3	72.6	75.9	79.2
12mcg/kg/min (ml/hr)	32.4	36	39.6	43.2	46.8	50.4	54	57.6	61.2	64.8	68.4	72	75.6	79.2	82.8	86.4
13mcg/kg/min (ml/hr)	35.1	39	42.9	46.8	50.7	54.6	58.5	62.4	66.3	70.2	74.1	78	81.9	85.8	89.7	93.6
14mcg/kg/min (ml/hr)	37.8	42	46.2	50.4	54.6	58.8	63	67.2	71.4	75.6	79.8	84	88.2	92.4	96.6	100.8
15mcg/kg/min (ml/hr)	40.5	45	49.5	54	58.5	63	67.5	72	76.5	81	85.5	90	94.5	99	103.5	108
16mcg/kg/min (ml/hr)	43.2	48	52.8	57.6	62.4	67.2	72	76.8	81.6	86.4	91.2	96	101	105.6	110.4	115.2
17mcg/kg/min (ml/hr)	45.9	51	56.1	61.2	66.3	71.4	76.5	81.6	86.7	91.8	96.9	102	107	112.2	117.3	122.4
18mcg/kg/min (ml/hr)	48.6	54	59.4	64.8	70.2	75.6	81	86.4	91.8	97.2	103	108	113	118.8	124.2	129.6
19mcg/kg/min (ml/hr)	51.3	57	62.7	68.4	74.1	79.8	85.5	91.2	96.9	103	108	114	120	125.4	131.1	136.8
20mcg/kg/min (ml/hr)	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144

Adverse effects: Hypertension, tachycardia, PVC's, headache, angina, SOB, phlebitis, palpitations, bronchospasm

Drug interactions: Concomitant use with cocaine, ergot alkaloids or COMT-inhibitors (e.g. Comtan) can result in severe hypertension. Beta blockers and dobutamine counteract one another (dobutamine is a beta agonist)

Contraindications: Subaortic stenosis

Nursing considerations:

1. Monitor ECG: can potentiate tachycardia and arrhythmias
2. Monitor continual VS especially BP: can cause hypertension
3. Monitor IV site: phlebitis (if extravasation occurs, treat with phentolamine)
4. Phentolamine administration: Dilute 10mg with 10ml 0.9% NaCl and inject into the affected area.

Dopamine

Indication: Shock & cardiopulmonary resuscitation

Available in 250ml premix bag of D5W at a concentration of 1.6mg/ml

Dosing:

Initiate at 2-5mcg/kg/min (1mcg/kg/min for patients with occlusive vascular disease)

Increase in increments of 1-4mcg/kg/min (5-10mcg/kg/min in severely ill patients) Q 10-30 minutes

MAX 50mcg/kg/min (Norepinephrine should be considered if dose exceeds 20mcg/kg/min)

Dosing Chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
1mcg/kg/min (ml/hr)	1.7	1.9	2.1	2.3	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	3.9	4.1	4.3	4.5
2mcg/kg/min (ml/hr)	3.4	3.8	4.1	4.5	4.9	5.3	5.6	6.0	6.4	6.8	7.1	7.5	7.9	8.3	8.6	9.0
3mcg/kg/min (ml/hr)	5.1	5.6	6.2	6.8	7.3	7.9	8.4	9.0	9.6	10.1	10.7	11.3	11.8	12.4	12.9	13.5
4mcg/kg/min (ml/hr)	6.8	7.5	8.3	9.0	9.8	10.5	11.3	12.0	12.8	13.5	14.3	15.0	15.8	16.5	17.3	18.0
5mcg/kg/min (ml/hr)	8.4	9.4	10.3	11.3	12.2	13.1	14.1	15.0	15.9	16.9	17.8	18.8	19.7	20.6	21.6	22.5
6mcg/kg/min (ml/hr)	10.1	11.3	12.4	13.5	14.6	15.8	16.9	18.0	19.1	20.3	21.4	22.5	23.6	24.8	25.9	27.0
7mcg/kg/min (ml/hr)	11.8	13.1	14.4	15.8	17.1	18.4	19.7	21.0	22.3	23.6	24.9	26.3	27.6	28.9	30.2	31.5
8mcg/kg/min (ml/hr)	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30.0	31.5	33.0	34.5	36.0
9mcg/kg/min (ml/hr)	15.2	16.9	18.6	20.3	21.9	23.6	25.3	27.0	28.7	30.4	32.1	33.8	35.4	37.1	38.8	40.5
10mcg/kg/min (ml/hr)	16.9	18.8	20.6	22.5	24.4	26.3	28.1	30.0	31.9	33.8	35.6	37.5	39.4	41.3	43.1	45.0
11mcg/kg/min (ml/hr)	18.6	20.6	22.7	24.8	26.8	28.9	30.9	33.0	35.1	37.1	39.2	41.3	43.3	45.4	47.4	49.5
12mcg/kg/min (ml/hr)	20.3	22.5	24.8	27.0	29.3	31.5	33.8	36.0	38.3	40.5	42.8	45.0	47.3	49.5	51.8	54.0
13mcg/kg/min (ml/hr)	21.9	24.4	26.8	29.3	31.7	34.1	36.6	39.0	41.4	43.9	46.3	48.8	51.2	53.6	56.1	58.5
14mcg/kg/min (ml/hr)	23.6	26.3	28.9	31.5	34.1	36.8	39.4	42.0	44.6	47.3	49.9	52.5	55.1	57.8	60.4	63.0
15mcg/kg/min (ml/hr)	25.3	28.1	30.9	33.8	36.6	39.4	42.2	45.0	47.8	50.6	53.4	56.3	59.1	61.9	64.7	67.5
16mcg/kg/min (ml/hr)	27.0	30.0	33.0	36.0	39.0	42.0	45.0	48.0	51.0	54.0	57.0	60.0	63.0	66.0	69.0	72.0
17mcg/kg/min (ml/hr)	28.7	31.9	35.1	38.3	41.4	44.6	47.8	51.0	54.2	57.4	60.6	63.8	66.9	70.1	73.3	76.5
18mcg/kg/min (ml/hr)	30.4	33.8	37.1	40.5	43.9	47.3	50.6	54.0	57.4	60.8	64.1	67.5	70.9	74.3	77.6	81.0
19mcg/kg/min (ml/hr)	32.1	35.6	39.2	42.8	46.3	49.9	53.4	57.0	60.6	64.1	67.7	71.3	74.8	78.4	81.9	85.5
20mcg/kg/min (ml/hr)	33.8	37.5	41.3	45.0	48.8	52.5	56.3	60.0	63.8	67.5	71.3	75.0	78.8	82.5	86.3	90.0

Adverse effects: Extravasation necrosis (treat with phentolamine), asthma exacerbation, hypotension, tachycardia, nausea, vomiting, vasoconstriction, conduction abnormalities.

Drug interactions: Ergot alkaloids (dangerous hypertension); procarbazine (antineoplastic agent) and MAOI's prolong and intensify Dopamine's cardiac stimulation and vasopressor effects (Dopamine should NOT be administered within 14 days of receiving an MAOI)

Contraindications: hypovolaemia, pheochromocytoma, ventricular fibrillation, ventricular tachycardia

Nursing considerations:

1. Monitor BP, ECG, HR
2. Monitor peripheral pulses
3. Monitor urine output
4. Monitor IV site: phlebitis (if extravasation occurs, treat with phentolamine)
5. Phentolamine administration: Dilute 10mg with 10ml 0.9% NaCl and inject into the affected area.

Epinephrine

Indication: Symptomatic bradycardia

Standard concentration: 4mcg/ml

Stable for 24 hours

Dosing:

Initiate at 1mcg/minute and titrate to effect.

Normal dosage range: 2-10mcg/minute

Dosing Chart:

	1mcg/min	2mcg/min	3mcg/min	4mcg/min	5mcg/min	6mcg/min	7mcg/min	8mcg/min	9mcg/min	10mcg/min
Rate (ml/hr)	15	30	45	60	75	90	105	120	135	150

Adverse effects: Tachycardia, dizziness, weakness, tremor, palpitations, headache.

Drug interactions: Concomitant use with cocaine, procarbazine (antineoplastic agent) and MAOI's increase the risk of hypertensive crisis.

Contraindications: Coronary insufficiency, and closed-angle glaucoma

Nursing considerations:

1. Monitor HR, BP
2. Monitor IV site: phlebitis (if extravasation occurs, treat with phentolamine)
3. Phentolamine administration: Dilute 10mg with 10ml 0.9% NaCl and inject into the affected area.

GI Cocktail

GI Cocktail: Donnatal liquid 10ml + Maalox 30ml

GI Cocktail + Lidocaine: Donnatal liquid 10ml + Maalox 30ml + Viscous Lidocaine 5ml

Haldol (haloperidol) (Intravenous)

Administration

Haldol can be given IV only in ER and ICU. Patient must have cardiac monitoring, rhythm strip with documented QT interval Q4, baseline vital signs, restraints per orders. Doses can be given no more frequently than 15 minutes. Dose should be diluted in 1-2mls of 0.9% NaCl and given over 5 minutes. Risk of torsades de pointes increases at total daily dosages of 35 – 50 mg or more. If Q-T interval exceeds 450 milliseconds, IV haloperidol should not be given. If the patient has a Q-T interval increase approaching 60 milliseconds, notify the physician to determine if he/she wishes to change medications.

Dosage

Recommended intravenous dose is 1-2 mg every 2-4 hours. Lower doses such as 0.25-0.5 mg q4 suggested for geriatric patients.

WEIGHT BASED HEPARIN PROTOCOL

Patient body weight _____ kg (2.2 lbs = 1 kg)
 Prelabs: PTT, PT/INR, & CBC/platelets. Labs must be drawn prior to therapy
 Standard Heparin Solution: 25,000 units/500ml D5W
 No IM injections. Guaic stools daily; CBC within 24 hours of starting heparin then Q 2 days up to 14 days.
 Select Criteria below:

Cardiac: Initial Bolus: 60 units/kg (Maximum bolus 4,000 units)
 Start infusion immediately after bolus 12 units/kg/hr (Max 1,000 units/hr = 20 ml/hr)
 [units x kg/50 = ml/hr] PTT in 6 hours

aPTT results	Rebolus Dose	Drip Rate Change	Next aPTT
< 35 seconds	70 units/kg	Increase 4units/kg/hr	6 hours
36 – 49 seconds	40 units/kg	Increase 2units/kg/hr	6 hours
50 – 70 seconds	None – goal range	None	6 hours ***if 2 consecutive PTT's within range then Q AM
71 – 99 seconds	None	Decrease 1units/kg/hr	6 hours
100 – 120 seconds	None	Decrease 2units/kg/hr	6 hours
> 120 seconds	None	HOLD 1 hour then decrease 3units/kg/hr	6 hours

PE & DVT: Initial Bolus: 80 units/kg
 Start infusion immediately after bolus 18 units/kg/hr
 [units x kg/50 = ml/hr] PTT in 6 hours

aPTT results	Rebolus Dose	Drip Rate Change	Next aPTT
< 35 seconds	70 units/kg	Increase 4units/kg/hr	6 hours
36 – 49 seconds	40 units/kg	Increase 3units/kg/hr	6 hours
50 – 70 seconds	None	Increase 2units/kg/hr	6 hours
71 – 99 seconds	None – goal range	No change	6 hours ***if 2 consecutive PTT's within range then Q AM
100 – 120 seconds	None	Decrease 1units/kg/hr	6 hours
> 120 seconds	None	HOLD 1 hour then decrease 2units/kg/hr	6 hours

Physician Signature: _____ Date: _____

Insulin Drip

1. Insulin Drip = 100 units Regular Insulin in 100 ml NS.
(1 ml = 1 unit Regular Insulin)
2. Bolus patient with 5 units Regular Insulin IV. Then start the Insulin Drip at 5 ml per hour.
If patient's blood sugar is > 1000 use a 10 unit bolus Regular Insulin IV and start the drip at 9 ml per hour.
3. Blood Sugar Assessment
If blood sugar is > 500 recheck glucose level Q2 hrs by LAB as STAT
If blood sugar is < 500 do finger stick Q1 hr to reassess blood sugar.
4. Blood sugar should decline by 50 points each hour (or 100 Q2 hrs).
If the blood Sugar does not decline:
Increase the drip by 2 units/hr until you see the expected decline of 50 points per hour.
**If the blood sugar is > 500 and not declining, increase by 4 units/hr
5. When blood sugar reaches 300, write an order to change the maintenance IVF orders to include D5W, and the patient may begin their ordered diet if able to eat.
This applies to patients who are acidotic or who are unable to eat
6. When blood sugar level reaches 150 or less decrease Insulin drip by 50%
7. When blood sugar reaches 100 or less, turn drip off for 15 minutes then resume at 50% (half) the rate. (round up to nearest whole number)
8. Recheck in thirty minutes. If still less than 100 discontinue Insulin drip and call Physician.

Integrilin (eptifibatide)

Indications:

- 1) Patients with acute coronary syndrome (unstable angina/non Q wave MI).
- 2) Patients undergoing PCI (percutaneous coronary intervention).

Standard Concentration: 2mg/ml

Drip stable for 2 months at room temperature

Dosing:

Bolus: 180mcg/kg (bolus is drawn up from drip and thus will have same concentration as the infusion: 2mg/ml) (Dose = 0.18mg/kg) (Volume = 0.09ml/kg)

Infusion Rate:

Normal renal function: 2mcg/kg/min (0.06ml/kg/hr)

Patients with CrCl < 50ml/min: 1mcg/kg/min (0.03ml/kg/hr)(use same bolus dose)

Dosing chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
Bolus (mg)	8.1	9.0	9.9	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18.0	18.9	19.8	20.7	21.6	22.5	23.4
Bolus (ml)	4.1	4.5	5.0	5.4	5.9	6.3	6.8	7.2	7.7	8.1	8.6	9.0	9.5	9.9	10.4	10.8	11.3	11.7
2 mcg/kg/min (ml/hr)	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9	7.2	7.5	7.8
1 mcg/kg/min for CrCl < 50 (ml/hr)	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	3.0	3.2	3.3	3.5	3.6	3.8	3.9

Adverse reactions: bleeding, thrombocytopenia, hypotension

Contraindications: SBP > 200 or DBP > 110 (sustained), aneurysm, dialysis, bleeding, thrombocytopenia, intracranial mass, recent trauma or major surgery, history of stroke in last 30 days, or any hemorrhagic stroke

Nursing considerations:

1. Monitor vital signs frequently and cardiac rhythm
2. Have resuscitation equipment available
3. Remove bolus from 100 ml vial
4. Spike 100 ml vial and run infusion
5. Caution with TPA, anticoagulants, other antiplatelet agents (increased risk of bleeding)
6. Draw initial labs: H/H, platelet count, serum Creatinine, PT/aPTT at baseline
7. Use is restricted to ER, ICU, PCU, and the Cath Lab
8. Administer 0.9% NaCl @ 20 ml/hour while on Integrilin
9. Maintenance labs: CBC 6 hours AFTER initiation of Integrilin, then daily. Notify physician for platelet count less than 100,000 or a drop in platelets of 50% or greater while on Integrilin.
10. Integrilin may be administered in the same IV line as atropine, dobutamine, heparin, nitroglycerin, verapamil, meperidine, morphine, or midazolam.
11. Do not give in the same IV line with Lasix.

Isuprel (isoproterenol)

Indication: Ventricular arrhythmias secondary to AV block

Standard Concentration: 4mcg/ml

Stable for 24 hours

Infusion should be protected from light.

Dosing:

20-60mcg (5-15ml) bolus followed by an infusion of 5mcg/min (75ml/hr)

Dose may be adjusted based on patient response and may range from 2-20mcg/min.

Dose (mcg/min)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Rate (ml/hr)	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300

Adverse effects: nervousness, restlessness, insomnia, anxiety, tension, fear, or excitement

Drug interactions: MAOI's, ergot alkaloids, and sympathomimetics (i.e. epinephrine interacts with isoproterenol by increasing endogenous release of catecholamines, increasing potential for CNS and cardiovascular toxicity)

Contraindications: atrial fibrillation, atrial flutter, digoxin toxicity, MAOI therapy, tachycardia, ventricular fibrillation, ventricular tachycardia

Nursing considerations:

1. Monitor: HR, ECG, BP
2. Use cautiously in coronary insufficiency, diabetes, MI, hyperthyroidism

Lanoxin (digoxin)

Indications: Atrial Fibrillation/Flutter, CHF

Dosing:

Loading Dose (IV or capsules): 10-15mcg/kg in 3 divided doses q 6-8 hours (50% with the first dose, then 25% of the total for the 2nd and 3rd doses)

Loading Dose (tablets): 12.5-18.75mcg/kg in 3 divided doses q 6-8 hours (50% with the first dose, then 25% of the total for the 2nd and 3rd doses)

Maintenance Dose (tablets): 0.125 mg - 0.25 mg daily OR (capsules) 0.1 – 0.2 mg daily

***NOTE: PO indicates tablets or elixir, which have 80% bioavailability. IV has 100% bioavailability as do capsules. Therefore, if capsules were used, you would calculate based on IV dosing.

Adverse effects: Bradycardia, Agitation, Hallucinations, Blur Vision, Nausea/Vomiting

Drug interactions:

1. Quinidine and verapamil increase digoxin concentrations via P-glycoprotein.
2. Potassium: Hyperkalaemia can induce digoxin toxicity at therapeutic levels.
3. Calcium: Serious arrhythmias can occur especially when receiving IV calcium rapidly (e.g. Calcium gluconate boluses)
4. The following medications may increase digoxin levels by inhibiting its clearance (amiodarone, felodipine, diltiazem, propafenone, quinidine, quinine, and verapamil)

Contraindications: AV block, ventricular fibrillation, Renal Disease (use cautiously)

Nursing considerations:

1. Monitor Apical HR, BP, ECG
2. Monitor electrolytes (esp. potassium and calcium)
3. Use with caution in MI, Pulmonary Disease, Hypothyroidism
4. Check serum Digoxin levels
 - A. Therapeutic range in heart failure: 0.5 – 0.8 ng/ml (ng/ml = mcg/L)
 - B. Therapeutic range in atrial fibrillation: 0.8 – 2 ng/ml (ng/ml = mcg/L)
5. Observe for digoxin toxicity
 - A. Sagging S-T segment (downward sloping)
 - B. Prolonged PR interval (> 0.2 second)
 - C. PVC's
 - D. Heart Block
 - E. Hyperkalaemia
 - F. Hypercalcemia

Levophed (norepinephrine)

Indications: Shock or severe hypotension

Standard Concentration: 16mcg/ml

Protect from light

Stable for 48 hours at room temperature or 30 days under refrigeration

Dosing: (Hypotension, shock, & cardiopulmonary resuscitation)

Initiate at 0.5-1mcg/min and titrate to effect. Usual effective dose is 8-12mcg/min. Max dose: 30mcg/min

Dosing Chart:

Dose (mcg/min)	0.5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	30
Rate (ml/hr)	1.9	3.8	7.5	11.3	15	18.8	22.5	26.3	30	33.8	37.5	41.3	45	48.8	52.5	56.3	112.5

Adverse effects: Dizziness, headache, insomnia, trembling, thyroid gland enlargement, hypertension, arrhythmias, asthma exacerbation.

Drug interactions: Concomitant use with cocaine, procarbazine (antineoplastic agent) and MAOI's increase the risk of hypertensive crisis.

Contraindications: MAOI therapy

Nursing considerations:

1. Monitor BP, ECG, HR, urine output
2. Monitor IV site: phlebitis (if extravasation occurs, treat with phentolamine)
3. Phentolamine administration: Dilute 10mg with 10ml 0.9% NaCl and inject into the affected area.
4. Monitor peripheral pulses

Lidocaine

Indications: Ventricular Arrhythmias including Ventricular Fibrillation (VFib) and Ventricular Tachycardia (VTach)

Standard Concentration: 4mg/ml (available as a premix)

Dosing:

Bolus: 50 – 100mg given at 25 – 50 mg/min (Syringes may be used for bolus)

Maintenance: 20 – 50 mcg/kg/min

Dosing Chart:

Dose (mg/min)	Rate
1 mg/min	15 ml/hr
2 mg/min	30 ml/hr
3 mg/min	45 ml/hr
4 mg/min	60 ml/hr

Adverse effects:

1. Lidocaine Toxicity: Confusion, Blurred Vision, Seizures, Slurred Speech
2. Other adverse effects: Hypotension, Bradycardia, Lethargy, Restlessness, and Tremors

Drug Interactions:

1. Lidocaine given with dofetilide could increase the risk of dofetilide-induced pro arrhythmias.
2. Lidocaine used in combination with MAOI's may increase the risk of hypotension.

Contraindications: Coagulopathy, Thrombocytopenia, Adams-Stokes syndrome, AV block, and infection/sepsis

Nursing Considerations:

1. Monitor ECG, HR, Electrolytes
2. Monitor serum drug level, normal (1.5 – 6 mcg/ml)(total drug bound and unbound)
3. Reduce dose if prolonged PR or QRS noted
4. Do not exceed 4 mg/min

Magnesium Replacement

Magnesium Level	IV Replacement
Mg < 1.0 and Symptomatic / Seizures	<ol style="list-style-type: none">1. Magnesium Sulfate 2gm/6ml IV push2. 0.5 meq/kg (IBW) infusion over 6 hours3. Check Magnesium level and symptoms 2 hours after infusion
Mg < 1.4 but Asymptomatic	<ol style="list-style-type: none">1. Magnesium Sulfate 2gm over 90 minutes x 2 runs2. Repeat Magnesium Level 2 hours after last bag and next a.m.3. Start over if Mg < 2.0
Mg 1.5 – 1.7	<ol style="list-style-type: none">1. Magnesium Sulfate 2gm over 90 minutes2. Repeat Magnesium Level the next a.m.
Mg 1.8 – 2.0	<ol style="list-style-type: none">1. Magnesium Sulfate 1gm over 1 hour2. Repeat Magnesium Level the next a.m.

Motrin (ibuprofen)

Pediatric Dosage Chart

Dose: 10 mg/kg

Concentration: 100mg/5ml

Weight (lb)	Weight (kg)	Dosage	Volume of liquid to give
6.6 lb	3 kg	30 mg	1.5 ml
8.8 lb	4 kg	40 mg	2 ml
11 lb	5 kg	50 mg	2.5 ml
13.2 lb	6 kg	60 mg	3 ml
15.4 lb	7 kg	70 mg	3.5 ml
17.6 lb	8 kg	80 mg	4 ml
19.8 lb	9 kg	90 mg	4.5 ml
22 lb	10 kg	100 mg	5 ml
24.2 lb	11 kg	110 mg	5.5 ml
26.4 lb	12 kg	120 mg	6 ml
28.6 lb	13 kg	130 mg	6.5 ml
30.8 lb	14 kg	140 mg	7 ml
33 lb	15 kg	150 mg	7.5 ml
35.2 lb	16 kg	160 mg	8 ml
37.4 lb	17 kg	170 mg	8.5 ml
39.6 lb	18 kg	180 mg	9 ml
41.8 lb	19 kg	190 mg	9.5 ml
44 lb	20 kg	200 mg	10 ml
46.2 lb	21 kg	210 mg	10.5 ml
48.4 lb	22 kg	220 mg	11 ml
50.6 lb	23 kg	230 mg	11.5 ml
52.8 lb	24 kg	240 mg	12 ml
55 lb	25 kg	250 mg	12.5 ml
57.2 lb	26 kg	260 mg	13 ml
59.4 lb	27 kg	270 mg	13.5 ml
61.6 lb	28 kg	280 mg	14 ml
63.8 lb	29 kg	290 mg	14.5 ml
66 lb	30 kg	300 mg	15 ml
68.2 lb	31 kg	310 mg	15.5 ml
70.4 lb	32 kg	320 mg	16 ml
72.6 lb	33 kg	330 mg	16.5 ml
74.8 lb	34 kg	340 mg	17 ml
77 lb	35 kg	350 mg	17.5 ml
79.2 lb	36 kg	360 mg	18 ml
81.4 lb	37 kg	370 mg	18.5 ml
83.6 lb	38 kg	380 mg	19 ml
85.8 lb	39 kg	390 mg	19.5 ml
88 lb	40 kg	400 mg	20 ml

Natrecor (nesiritide)

Indication: Decompensated heart failure with dyspnea at rest
 Standard Concentration: 6mcg/ml (1.5mg mixed in 250ml of D5W)
 Stable for 24 hours

Dosing:

Bolus: 2mcg/kg (Bolus volume = kg/3) to be given over 1 minute (bolus is drawn up from drip and thus will have same concentration as the infusion: 6mcg/ml)

Infusion: 0.01mcg/kg/min = 0.1ml/kg/hour

If hypotension occurs, the drip may be discontinued. When the infusion is restarted, infuse at 0.007mcg/kg/min = 0.07ml/kg/hr (30% reduction)

Dosing Chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
Bolus (mcg)	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260
Bolus (ml)	15.0	16.7	18.3	20.0	21.7	23.3	25.0	26.7	28.3	30.0	31.7	33.3	35.0	36.7	38.3	40.0	41.7	43.3
Rate (ml/hr): (0.1ml/kg/hr)	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
Rate (ml/hr) if hypotension occurs: (0.07ml/kg/hr)	3.2	3.5	3.9	4.2	4.6	4.9	5.3	5.6	6.0	6.3	6.7	7.0	7.4	7.7	8.1	8.4	8.8	9.1

Adverse reactions: hypotension, ventricular tachycardia

Drug interactions: Any antihypertensives also including nitrates and sildenafil may have additive hypotensive effects when used concurrently with nesiritide

Contraindications: Aortic stenosis, Cardiogenic shock, constrictive pericarditis, hypertrophic subaortic stenosis, mitral stenosis, pericardial effusion, and E. coli protein hypersensitivity

Nursing considerations:

1. Natrecor is restricted to cardiologists or approval by a cardiologist consultant.
2. May only be initiated in ER, ICU or PCU. Patient may be transferred to floor for maintenance infusion at the discretion of the cardiologist.
3. If SBP < 90 mmHg at baseline, verify if the cardiologist wants to continue with therapy.
4. Blood pressure checks should be performed q 15 minutes x 4 followed by a check 1 hour later, then q 4 hours for the duration of the infusion.
5. If hypotension occurs, hold and contact the physician
6. Monitor creatinine/BUN
7. Do not administer in same IV line with Lasix, Heparin, Insulin, Bumetanide, Ethacrynate sodium, Hydralazine, Sodium Metabisulfite
8. Do not infuse Natrecor for more than 48 hours.

Neo-Synephrine (phenylephrine)

Indications: Severe Hypotension or Shock

Standard Concentration: 100mcg/ml

Stable for 48 hours

Dosing:

Initiate at 100-180mcg/min. Titrate to effect. Once pressure stabilizes, 40-60mcg/min is usually adequate.

Dosing Chart:

Dose (mcg/min)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
Rate (ml/hr)	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108

Adverse effects: Hypertension, tachycardia, palpitations, PVC's, extravasation tissue necrosis (treat with phentolamine), arrhythmias, asthma exacerbation.

Drug interactions: Ergot alkaloids (dangerous hypertension); procarbazine (antineoplastic agent) and MAOI's prolong and intensify phenylephrine's cardiac stimulation and vasopressor effects (phenylephrine should NOT be administered within 14 days of receiving an MAOI)

Contraindications: Ventricular Fibrillation, Ventricular Tachycardia, Cardiomyopathy, Closed-angle Glaucoma, Hypertension, MAOI therapy, and Tachycardia

Nursing considerations:

1. Monitor BP, ECG, HR
2. Monitor urine output
3. Monitor IV site: phlebitis (if extravasation occurs, treat with phentolamine)
4. Phentolamine administration: Dilute 10mg with 10ml 0.9% NaCl and inject into the affected area.

Nipride (nitroprusside)

Indication: Hypertensive crisis

Standard concentration: 200mcg/ml (50mg in 250ml of D5W)

Stable for 24 hours at room temperature

Drip MUST be mixed in D5W and PROTECTED FROM LIGHT

Dosing:

Initiate at 0.25-0.3mcg/kg/min

In hypertensive crisis, MAP should be reduced by no more than 25% over the first hour, then *if the patient is stable*, follow with a stable reduction in BP toward 160/100-110 over 2 to 6 hours. Doses may be titrated every 5-10 minutes.

Do not exceed 10mcg/kg/min

Dosing Chart:

Patient Weight (kg)	0.25 mcg/kg/min (ml/hr)	1 mcg/kg/min (ml/hr)	2 mcg/kg/min (ml/hr)	3 mcg/kg/min (ml/hr)	4 mcg/kg/min (ml/hr)	5 mcg/kg/min (ml/hr)	6 mcg/kg/min (ml/hr)	7 mcg/kg/min (ml/hr)	8 mcg/kg/min (ml/hr)	9 mcg/kg/min (ml/hr)	10 mcg/kg/min (ml/hr)
45	3.4	13.5	27	40.5	54	67.5	81	94.5	108	121.5	135
50	3.8	15	30	45	60	75	90	105	120	135	150
55	4.1	16.5	33	49.5	66	82.5	99	115.5	132	148.5	165
60	4.5	18	36	54	72	90	108	126	144	162	180
65	4.9	19.5	39	58.5	78	97.5	117	136.5	156	175.5	195
70	5.3	21	42	63	84	105	126	147	168	189	210
75	5.6	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225
80	6.0	24	48	72	96	120	144	168	192	216	240
85	6.4	25.5	51	76.5	102	127.5	153	178.5	204	229.5	255
90	6.8	27	54	81	108	135	162	189	216	243	270
95	7.1	28.5	57	85.5	114	142.5	171	199.5	228	256.5	285
100	7.5	30	60	90	120	150	180	210	240	270	300
105	7.9	31.5	63	94.5	126	157.5	189	220.5	252	283.5	315
110	8.3	33	66	99	132	165	198	231	264	297	330
115	8.6	34.5	69	103.5	138	172.5	207	241.5	276	310.5	345
120	9.0	36	72	108	144	180	216	252	288	324	360
125	9.4	37.5	75	112.5	150	187.5	225	262.5	300	337.5	375
130	9.8	39	78	117	156	195	234	273	312	351	390

Adverse reactions: cyanide toxicity, methemoglobinaemia, thiocyanate toxicity, increased ICP, dizziness, N & V, diaphoresis, abdominal pain, reflex tachycardia, muscle twitching, acidosis, elevated SCr, bradycardia, flushing

Drug interactions: Ergot alkaloids (antagonize vasoconstrictive properties of nitroprusside)

Contraindications: Cyanide Toxicity

Nursing considerations:

1. Protect bag from light
2. Monitor BP continuously
3. Monitor for toxicity (Nipride is metabolized to cyanide and thiocyanate) Thiocyanate is mildly neurotoxic at serum concentrations of 60mcg/ml and life threatening at 200mcg/ml.
4. Patients receiving rates exceeding 3mcg/kg/minute for greater than 72 hours must have thiocyanate levels drawn.
5. Caution in renal failure (increased risk of cyanide toxicity)

Phosphate Replacement

Products		mg of PO ₄	mmol of PO ₄	meq of Na ⁺	meq of K ⁺
IV	KPO ₄	94	3	0	4.4
IV	NaPO ₄	94	3	4	0
PO	Neutra-phos	250	8	7.1	7.1
PO	Neutra-phos-K	250	8	0	14.3
PO	K-Phos	125	4	2.9	1.4
PO	K-Phos Neutral	250	8	13.1	1.4

mg, mmol, and meq of IV products is per ml; PO products is per dosage unit

Phosphate Level	IV Replacement	Oral Replacement
Less than 1.5	<ol style="list-style-type: none"> 1. Stop any calcium or dextrose containing fluid (e.g. TPN) until phos has been replaced. Emergency medications (e.g. vasopressors) mixed in dextrose may be continued. 2. Do NOT Y-site with running TPN 3. 0.5 mmol/kg Na-Phos/250ml NS over 4 hours 4. Repeat phos level in 2 hours 5. Restart infusion that were stopped in #1 when phos > 2.0 6. Once phos > 2.0, Repeat phos level following a.m. 	No oral replacement
1.5 – 2.0	<ol style="list-style-type: none"> 1. Stop any calcium containing fluid (e.g. TPN) while phos infusion is running or run through a different line as the two are not compatible. 2. 0.25 mmol/kg Na-Phos/250ml NS over 4 hours 3. May continue dextrose containing fluids 4. Repeat phos level in 2 hours 5. Once phos > 2.0, Repeat phos level following a.m. 	<ol style="list-style-type: none"> 1. Na Phos PO 0.25mmol/kg (recommend using K-Phos Neutral) 2. Repeat phos level in a.m.
2.1 – 2.4	<ol style="list-style-type: none"> 1. Stop any calcium containing fluid (e.g. TPN) while phos infusion is running or run through a different line as the two are not compatible. 2. 0.15 mmol/kg Na-Phos/250ml NS over 4 hours 3. May continue dextrose containing fluids 4. Repeat phos level the following a.m. 	<ol style="list-style-type: none"> 1. Na Phos PO 0.15mmol/kg (recommend using K-Phos Neutral) 2. Repeat phos level in a.m.

*****This dosing regimen utilizes replacing phosphate independently from potassium to prevent the possibility of overcorrecting one while correcting the other.**

Potassium Replacement

ISMP/JACHO regulation: concentrated electrolytes

- No concentrated potassium vials (e.g. 20 meq/ 10 ml) are to ever leave the pharmacy.
- Premixed IVs exist: 10 meq/ 50 ml, 20 meq/ 100 ml, 40 meq/liter.
- Caution: While 40 meq/ 100 ml exists, it may not be used as a safe product.

Guidelines for IV administration of potassium

Route of Administration	Concentration	Max concentration in large volume	Maximum Rate
Peripheral	10meq/100ml	40meq/L	10meq/hour
Central	20meq/100ml	80meq/L	10meq/hour

Potassium Replacement	IV Route NPO, Severe Diarrhea	Oral Route Tolerating oral diet or tube feed)
$K^+ < 3.0$	<ol style="list-style-type: none"> Order STAT Mg Level KCl 40meq IV Repeat K^+ Level 1 hour after last dose Notify physician of current IVF and K^+/L of that fluid Start over if $K^+ < 4.0$ 	IV only for first "round" until K is at least 3.0 meq/L
$K^+ 3.0 - 3.4$	<ol style="list-style-type: none"> Order STAT Mg Level KCl 30meq IV Repeat K^+ Level 1 hour after last dose Notify physician of current IVF and K^+/L of that fluid Start over if $K^+ < 4.0$ 	<ol style="list-style-type: none"> Order Mg Level ASAP (if > 24 hours old) KCl 20 meq PO/NG now KCl 20 meq PO/NG in 2 hours Repeat K^+ Level 2 hours after last dose Notify physician of current IVF and K^+/L of that fluid Start over if $K^+ < 4.0$
$K^+ 3.5 - 3.8$	<ol style="list-style-type: none"> KCl 20meq IV Repeat K^+ Level 1 hour after last dose Start over if $K^+ < 4.0$ 	<ol style="list-style-type: none"> KCl 20 meq PO/NG now Repeat K^+ Level 2 hours after dose Notify physician of current IVF and K^+/L of that fluid Start over if $K^+ < 4.0$
$K^+ 3.8 - 3.9$	<ol style="list-style-type: none"> KCl 20meq IV Repeat K^+ Level in a.m. 	<ol style="list-style-type: none"> KCl 20 meq PO/NG now Repeat K^+ Level in a.m.

Precedex (dexmedetomidine)

Indication: Sedation (not to exceed 24 hours) of intubated and mechanically ventilated patients

Standard Concentration: 4mcg/ml

Total infusion time should not exceed 24 hours

Stable at room temperature for 48 hours

Dosing:

Bolus: 1mcg/kg over 10 minutes (bolus is drawn up from drip and thus will have same concentration as the infusion: 4mcg/ml)

Infusion Rate: 0.2-0.7mcg/kg/hour

Patients with hepatic failure should require lower doses.

Patients with renal failure may also require lower doses.

Dosing chart:

Weight: (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
1mcg/kg (ml) (Bolus)	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20	21.3	22.5	23.8	25.0	26.3	27.5	28.8	30.0	31.3	32.5
0.2mcg/kg/hr (ml/hr)	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4	4.3	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.3	6.5
0.25mcg/kg/hr (ml/hr)	2.8	3.1	3.4	3.8	4.1	4.4	4.7	5	5.3	5.6	5.9	6.3	6.6	6.9	7.2	7.5	7.8	8.1
0.3mcg/kg/hr (ml/hr)	3.4	3.8	4.1	4.5	4.9	5.3	5.6	6	6.4	6.8	7.1	7.5	7.9	8.3	8.6	9.0	9.4	9.8
0.35mcg/kg/hr (ml/hr)	3.9	4.4	4.8	5.3	5.7	6.1	6.6	7	7.4	7.9	8.3	8.8	9.2	9.6	10.1	10.5	10.9	11.4
0.4mcg/kg/hr (ml/hr)	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
0.45mcg/kg/hr (ml/hr)	5.1	5.6	6.2	6.8	7.3	7.9	8.4	9	9.6	10.1	10.7	11.3	11.8	12.4	12.9	13.5	14.1	14.6
0.5mcg/kg/hr (ml/hr)	5.6	6.3	6.9	7.5	8.1	8.8	9.4	10	10.6	11.3	11.9	12.5	13.1	13.8	14.4	15.0	15.6	16.3
0.55mcg/kg/hr (ml/hr)	6.2	6.9	7.6	8.3	8.9	9.6	10.3	11	11.7	12.4	13.1	13.8	14.4	15.1	15.8	16.5	17.2	17.9
0.6mcg/kg/hr (ml/hr)	6.8	7.5	8.3	9.0	9.8	10.5	11.3	12	12.8	13.5	14.3	15.0	15.8	16.5	17.3	18.0	18.8	19.5
0.65mcg/kg/hr (ml/hr)	7.3	8.1	8.9	9.8	10.6	11.4	12.2	13	13.8	14.6	15.4	16.3	17.1	17.9	18.7	19.5	20.3	21.1
0.7mcg/kg/hr (ml/hr)	7.9	8.8	9.6	10.5	11.4	12.3	13.1	14	14.9	15.8	16.6	17.5	18.4	19.3	20.1	21.0	21.9	22.8

Adverse reactions: hypotension, bradycardia, & sinus arrest. (as a result of increased vagal tone) Atropine or glycopyrrolate may be effective in treating side effects by modifying vagal tone. Vasopressors may also be effective.

Drug Interactions: amoxapine, antihypertensives, maprotiline, phenothiazines, tricyclic antidepressants (all can cause additive sedative effects prolonging anesthesia recovery)

Nursing Considerations: ECG, monitor HR and BP

Ramsay Level of Sedation Scale	
Clinical Score	Level of Sedation Achieved
6	Asleep, no response
5	Asleep, sluggish response to light glabellar tap or loud auditory stimulus
4	Asleep, but with brisk response to light glabellar tap or loud auditory stimulus
3	Patient responds to commands
2	Patient cooperative, oriented, and tranquil
1	Patient anxious, agitated, or restless

Precedex (continued)

Precedex Administration With Other Fluids/Medications

Compatibility of Precedex® with co-administration of blood, serum, or plasma has not been established. Precedex® has been shown to be **compatible** when administered with the following intravenous fluids and medications:

5% dextrose in water	dopamine	metronidazole
0.9% sodium chloride	doxycycline	midazolam
Lactated Ringer's	droperidol	milrinone
alfentanil	enalaprilat	mivacurium
amikacin	ephedrine	morphine
sulfate	epinephrine	nalbuphine
aminophylline	hydrochloride	Nipride
amiodarone	erythromycin	nitroglycerin
ampicillin	esmolol	norepinephrine
ampicillin-sulbactam	etomidate	ofloxacin
atracurium besylate	famotidine	ondansetron
atropine	fenoldopam	pancuronium
azithromycin	fentanyl	phenylephrine
aztreonam	citrate	piperacillin
bretylum	fluconazole	piperacillin-tazobactam
bumetanide	furosemide	potassium chloride
butorphanol	gatifloxacin	procainamide
calcium gluconate	gentamicin sulfate	prochlorperazine
cefazolin	glycopyrrolate	promethazine
cefepime	granisetron	propofol
cefoperazone	hydrochloride	ranitidine
cefotaxime	haloperidol lactate	rapacuronium
cefotetan	heparin sodium	remifentanil
cefoxitin	hydrocortisone	hydrochloride
ceftazidime	hydromorphone	rocuronium
ceftizoxime	hydrochloride	sodium bicarbonate
ceftriaxone	hydroxyzine	sodium nitroprusside
sodium	inamrinone lactate	succinylcholine
cefuroxime sodium	isoproterenol	sufentanil
chlorpromazine	ketorolac	citrate
cimetidine	tromethamine	sulfamethoxazole-
ciprofloxacin	labetalol	trimethoprim
cisatracurium besylate	levofloxacin	theophylline
clindamycin phosphate	lidocaine	thiopental
dexamethasone	linezolid,	ticarcillin
digoxin	lorazepam	ticarcillin- clavulanate
diltiazem	magnesium sulfate	tobramycin
hydrochloride	mannitol 20%	vancomycin
diphenhydramine	meperidine	vecuronium
dobutamine	methylprednisolone	verapamil
dolasetron mesylate	metoclopramide	

Primacor (milrinone)

Indication: Acute Decompensated Heart Failure

Available in premix of 200mcg/ml

Dosing: 50mcg/kg bolus over 10 minutes then 0.375-0.75mcg/kg/minute.

Dosage in renal impairment:

CrCl 40-50ml/min: Same bolus then 0.43mcg/kg/min.

CrCl 30-40ml/min: Same bolus then 0.38mcg/kg/min.

CrCl 20-30ml/min: Same bolus then 0.33mcg/kg/min.

CrCl 10-20ml/min: Same bolus then 0.28mcg/kg/min.

CrCl 5-10ml/min: Same bolus then 0.23mcg/kg/min.

CrCl < 5ml/min: Same bolus then 0.2mcg/kg/min.

Dosing Chart:

Weight (kg)	50mcg /kg (ml)	0.75mcg /kg/min (ml/hr)	0.5mcg/ kg/ min (ml/hr)	0.43mcg /kg/ min (ml/hr)	0.38mcg /kg/ min (ml/hr)	0.375mcg/ kg/ min (ml/hr)	0.33mcg /kg/ min (ml/hr)	0.28mcg /kg/ min (ml/hr)	0.23mcg /kg/ min (ml/hr)	0.2mcg/ kg/ min (ml/hr)
45	11.3	10.1	6.8	5.8	5.1	5.1	4.5	3.8	3.1	2.7
50	12.5	11.3	7.5	6.5	5.7	5.6	5	4.2	3.5	3
55	13.8	12.4	8.3	7.1	6.3	6.2	5.4	4.6	3.8	3.3
60	15	13.5	9.0	7.7	6.8	6.8	5.9	5	4.1	3.6
65	16.3	14.6	9.8	8.4	7.4	7.3	6.4	5.5	4.5	3.9
70	17.5	15.8	10.5	9.0	8.0	7.9	6.9	5.9	4.8	4.2
75	18.8	16.9	11.3	9.7	8.6	8.4	7.4	6.3	5.2	4.5
80	20	18.0	12.0	10.3	9.1	9.0	7.9	6.7	5.5	4.8
85	21.3	19.1	12.8	11.0	9.7	9.6	8.4	7.1	5.9	5.1
90	22.5	20.3	13.5	11.6	10.3	10.1	8.9	7.6	6.2	5.4
95	23.8	21.4	14.3	12.3	10.8	10.7	9.4	8	6.6	5.7
100	25	22.5	15.0	12.9	11.4	11.3	9.9	8.4	6.9	6
105	26.3	23.6	15.8	13.5	12.0	11.8	10.4	8.8	7.2	6.3
110	27.5	24.8	16.5	14.2	12.5	12.4	10.9	9.2	7.6	6.6
115	28.8	25.9	17.3	14.8	13.1	12.9	11.4	9.7	7.9	6.9
120	30	27.0	18.0	15.5	13.7	13.5	11.9	10.1	8.3	7.2
125	31.3	28.1	18.8	16.1	14.3	14.1	12.4	10.5	8.6	7.5
130	32.5	29.3	19.5	16.8	14.8	14.6	12.9	10.9	9	7.8

Adverse effects: Ventricular arrhythmias, ventricular ectopy, headache, hypotension, angina.

Drug Interactions: Primacor causes additive effects of the following medications and thus their dosages may need to be reduced: antihypertensives, diuretics, and Arglylin

Contraindications: Valvular heart disease

Nursing Considerations:

1. Monitor ECG, HR, BP
2. Monitor Pulse Ox, lung sounds

Pronestyl (procainamide)

Indications:

1. Ventricular Tachycardia with pulses (stable monomorphic or wide-complex regular ventricular tachycardia) during cardiopulmonary resuscitation (CPR) in patients with preserved left ventricular function
2. Documented Ventricular Arrhythmias (e.g. sustained VTach, Atrial fibrillation/flutter, or PSVT)

Standard Concentration: 4mg/ml (1000mg in 250ml D5W)

Dosing:

Bolus:

1. VTach during CPR: 20 mg/min (300ml/hr) IV until either ventricular tachycardia resolves, the patient becomes hypotensive, the QRS complex is widened by 50% of its original width, or up to the total dose of 17 mg/kg (1.2 g for a 70 kg patient). In urgent situations, up to 50 mg/min IV may be administered, up to 17 mg/kg IV total dose.
2. Documented Ventricular Arrhythmias: 15 – 17mg/kg @ 20 – 30 mg/min

Maintenance: 1–4 mg/minute as a continuous IV infusion. The usual initial maintenance dose is about 50 mg/kg/day; lower doses should be used in patients with renal dysfunction or reduced cardiac output. Adjust dosage based on renal function, clinical goals, and serum drug level monitoring.

Dosing Chart:

Dose (mg/min)	Rate
1 mg/min	15 ml/hr
2 mg/min	30 ml/hr
3 mg/min	45 ml/hr
4 mg/min	60 ml/hr

Maximum Bolus Dose and the time of infusion @ 20mg/min for VTach During CPR

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
17mg/kg (mg)	765	850	935	1020	1105	1190	1275	1360	1445	1530	1615	1700	1785	1870	1955	2040	2125	2210
Max Duration at 20mg/min (minutes)	38	43	47	51	55	60	64	68	72	77	81	85	89	94	98	102	106	111

Adverse effects: Prolonged QT, Hypotension, Ventricular Tachycardia/Fib, Nausea/Vomit/Diarrhea, Thrombocytopenia/Neutropenia/Agranulocytosis, Hallucinations, Lupus (reversible once medication is discontinued)

Contraindications: AV block, QT prolongation, torsade de pointes, and ester local anesthetic hypersensitivity; Myasthenia Gravis (worsens condition)

Nursing Considerations:

1. Monitor HR, BP, ECG
2. Check serum procainamide levels; normal: 10 – 20 mcg/ml (NAPA-N-acetyl procainamide) is the active metabolite of procainamide
3. Use cautiously in CHF/MI
4. Monitor for prolonged QT and widened QRS
5. Monitor serum potassium levels and electrolytes (can be enhanced)

Protamine

Indications: Reversal of heparin, Lovenox, or Fragmin (Dalteparin)

Dilute in 100ml of 0.9% NaCl

Stable for at least 10 days at room temperature

Do not give any faster than 50mg per 10 minutes

May cause severe hypotension and bradycardia. Patients who are having cardiovascular symptoms already may need the drug to be administered slower (e.g. 50mg per hour)

Dosing:

Heparin overdose:	
Time since Heparin was given	Dose of Protamine
< 30 minutes	1-1.5mg per 100 units of Heparin given
> 30 minutes	0.5mg per 100 units of Heparin given
> 2 hours	0.25-0.375mg per 100 units of Heparin given

Lovenox overdose:	
Time since Lovenox was given	Dose of protamine
0-8 hours	1mg per mg of Lovenox given
8-12 hours	0.5mg per mg of Lovenox given
> 12 hours	Protamine is probably not required

Dalteparin overdose:
Give 1mg of protamine per 100 anti-Xa units of dalteparin. Infusion may be repeated if aPTT remains prolonged 2-4 hours after giving first dose of protamine.

Adverse reactions: Hypotension, bradycardia, circulatory collapse, bronchospasm, anaphylaxis, pulmonary edema/hypertension.

Precautions: Diabetic patients or patients with fish allergy may be at increased risk for anaphylactic reaction to protamine

Nursing Considerations: Monitor blood pressure and PTT levels

REFLUDAN (Lepirudan) for INJECTION DOSING PROTOCOL

Refludan is indicated for anticoagulation therapy in patients with heparin-induced thrombocytopenia (HIT) and associated thromboembolic disease in order to prevent further thromboembolic complications

Discontinue: Heparin, Heparin Flushes, Enoxaparin, Warfarin

Patient weight (actual body weight in kg) _____ (use maximum of 110 kg)

Baseline labs: aPPT, PT, CBC w/diff, SrCr if not done in last 12 hours

DO NOT begin Refludan on a patient who presents with a baseline aPTT >80

REFLUDAN INITIAL DOSING

DO NOT EXCEED 110 kg when calculating doses

CrCL (ml/min)	Bolus Dose	Initial infusion rate
<input type="checkbox"/> >60	0.4 mg/kg	0.15 mg/kg/hr
<input type="checkbox"/> 45 - 60	0.2 mg/kg	0.075 mg/kg/hr
<input type="checkbox"/> 30 - 44	0.2 mg/kg	0.045 mg/kg/hr
<input type="checkbox"/> 15 - 29	0.2 mg/kg	0.0225 mg/kg/hr
<input type="checkbox"/> **<15	0.1 mg/kg	NO INFUSION

****In hemodialysis patients or in cases of acute renal failure (CrCl<15 or SrCr>6), infusion of Refludan is to be avoided (consider Argatroban). Additional IV bolus doses of 0.1 mg/kg actual body weight should be considered every other day if the aPTT falls below the lower therapeutic limit of 50.**

MONITORING

- STAT aPTT 4 hours after start of Refludan
- Repeat aPTT 4 hours after any change in infusion rate or administration of IV bolus
- Daily aPTT after aPTT in therapeutic range X2 consecutive readings (more frequent monitoring is recommended in those with renal impairment, changing renal function, serious liver injury or with an increased risk of bleeding).

DOSE MODIFICATION GUIDELINES

aPTT	Dosage Adjustment
< 50	Increase dose by 20% (Calculation: Current rate x 1.2)
50 - 80	No change
> 80	Decrease dose by 50% (Calculation: Current rate x 0.5)

Do not exceed 0.21 mg/kg/hour without checking for coagulation abnormalities that may inhibit accurate aPTT response to refludan therapy.

Consult Hematologist YES NO

ANY ADJUSTMENT to infusion is to be documented per physician order.

Physician signature: _____ Date: _____

Patient name: _____

Sandostatin (octreotide)

Indication: Bleeding Esophageal Varices

Stable for 14 days at room temperature

Medication is light sensitive and thus drip should be in an amber bag.

Standard Concentration: 2mcg/ml (500mcg in 250ml D5W)

Dosing:

Esophageal varices: 50mcg (25ml) bolus followed by 25-50mcg/hr (12.5-25ml/hr)

Adverse reactions: bradycardia, conduction abnormalities, GI disorders, hyper/hypoglycemia (hyperglycemia more common), hypothyroidism, injection site reactions, flu-like symptoms (fatigue, dizziness, headache, malaise, fever, dyspnea, back pain, chest pain)

Drug Interactions: any medication that may prolong QT interval such as astemizole, droperidol, halogenated anesthetics, perphenazine, terfenadine, and thioridazine.

Monitoring Parameters:

1. Blood glucose
2. Serum IGF-1 concentrations
3. Thyroid function tests
4. Abdominal pain may be indicative of biliary adverse effects (gallbladder and bile ducts should be checked out)

Solu-Medrol (methylprednisolone) for Spinal Cord Injury

1. Determine patient's weight.
2. Determine if patient has any allergies
3. The dose is 30mg/kg bolus over 15 minutes, then 5.4mg/kg/hr.
 - a. If patient presents within 3 hours of injury, run infusion over 23 hours
 - b. If patient presents within 3-8 hours of injury, run infusion over 47 hours
 - c. If patient presents greater than 8 hours after injury, use of high dose methylprednisolone therapy may have deleterious effects
4. Bolus dose should be diluted in 50ml 0.9% NaCl.
5. Infusion should be mixed in a 500ml bag. (one 23 hour bag or two 23.5 hour bags for 47 hour infusion)
6. Bags should be run until empty. (Even if bag lasts for more or less than 23 hours)

Dosing Chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
30mg/kg bolus (gm)	1.35	1.5	1.65	1.8	1.95	2.1	2.25	2.4	2.55	2.7	2.85	3	3.15	3.3	3.45	3.6	3.75	3.9
5.4mg/kg/hr (mg/hr)	243	270	297	324	351	378	405	432	459	486	513	540	567	594	621	648	675	702
Total 23 hour infusion bag (gm)	5.59	6.21	6.83	7.45	8.07	8.69	9.32	9.94	10.56	11.18	11.80	12.42	13.04	13.66	14.28	14.90	15.53	16.15
47 hour infusion (grams per bag)***	5.71	6.35	6.98	7.61	8.25	8.88	9.52	10.15	10.79	11.42	12.06	12.69	13.32	13.96	14.59	15.23	15.86	16.50

***47 hour infusion is in grams per bag. Patient will receive 2 bags for 23.5 hours.

Grams listed in table is grams in each bag.

TNKase (Tenecteplase)

Indication: Acute MI

Dosage: A single bolus should be administered over 5 seconds IV

Patient weight (kg)	TNKase (mg)	ml of TNKase
< 60	30	6
60 to < 70	35	7
70 to < 80	40	8
80 to < 90	45	9
90 or more	50	10

Adverse effects: Bleeding & Allergic Reaction

Contraindications: Active Internal Bleeding, CVA, Intracranial or Intra-spinal Surgery/Trauma within 2 months, Intracranial Neoplasm, Arteriovenous Malformation or Aneurysm, Known Bleeding Diathesis, Severe or Uncontrolled Hypertension

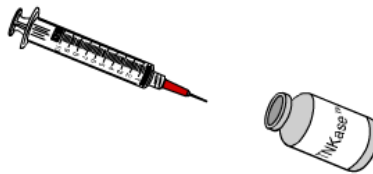
Nursing Considerations:

1. Use TNKase protocol (e.g. Lovenox should be ordered)
2. Obtain 2-3 IV lines (#18 gauge)
3. Monitor ECG, HR, and BP continuously
4. Consult cardiology
5. Obtain labs
6. Have resuscitation equipment available
7. Observe for signs of bleeding
8. Observe for reperfusion rhythms (blocks, bradycardia, PVC's, V. tach)
9. Initiate as soon as possible after an acute MI
10. DO NOT MIX WITH D5W: PRECIPITATION

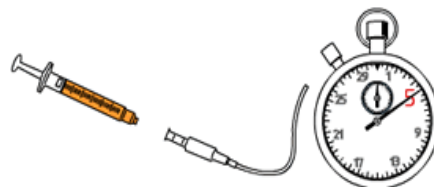
Administration Instructions

Step 1 Determine the correct dose of TNKase based on patient weight. TNKase is for IV administration only.

Step 2 WITHDRAW the appropriate volume of solution based on patient weight. The recommended total dose should not exceed 50 mg. Discard solution remaining in the vial.



Step 3 FLUSH a dextrose-containing line with a saline-containing solution prior to and following administration (precipitation may occur when TNKase is administered in an IV line containing dextrose). ADMINISTER as an IV BOLUS over 5 seconds.



Tridil (nitroglycerin)

Indications: Angina, Myocardial Infarction, Hypertension, and CHF

Available in 250ml premix bottle of D5W at a concentration of 200mcg/ml

Dosing: (Angina)

Initiate at 5mcg/minute. Increase by 5mcg/minute every 3-5 minutes up to 20mcg/minute. At 20mcg/minute, increase by 10mcg/minute increments.

Dosing Chart:

Dose (mcg/min)	5	10	15	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
Rate (ml/hr)	1.5	3	4.5	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60

Adverse effects: Headache, lightheadedness, flushing, hypotension, reflex tachycardia, tolerance with extended use.

Drug Interactions: Ergot Alkaloids (may precipitate angina because of its opposition to vasodilatory properties of nitroglycerin), sildenafil, vardenafil, tadalafil (nitrates amplify effects of these medications and can result in severe hypotension)

Contraindications: Cardiac Tamponade, Constrictive Pericarditis, Increased Intracranial Pressure, Intracranial Bleeding, Pericardial Effusion

Nursing Considerations:

1. Monitor BP, ECG
2. Use special tubing
3. Provide relief for side effects: headache

Tylenol (acetaminophen)

Pediatric Dosage Chart

Dose: 15 mg/kg

Weight (lb)	Weight (kg)	Dosage	Drops (100mg/ml)	Elixir (650mg/20.3ml)
6.6 lb	3 kg	45 mg	0.45 ml	1.41 ml
8.8 lb	4 kg	60 mg	0.60 ml	1.87 ml
11 lb	5 kg	75 mg	0.75 ml	2.34 ml
13.2 lb	6 kg	90 mg	0.90 ml	2.81 ml
15.4 lb	7 kg	105 mg	1.05 ml	3.28 ml
17.6 lb	8 kg	120 mg	1.20 ml	3.75 ml
19.8 lb	9 kg	135 mg	1.35 ml	4.22 ml
22 lb	10 kg	150 mg	1.50 ml	4.68 ml
24.2 lb	11 kg	165 mg	1.65 ml	5.15 ml
26.4 lb	12 kg	180 mg	1.80 ml	5.62 ml
28.6 lb	13 kg	195 mg	1.95 ml	6.09 ml
30.8 lb	14 kg	210 mg	2.10 ml	6.56 ml
33 lb	15 kg	225 mg	2.25 ml	7.03 ml
35.2 lb	16 kg	240 mg	2.40 ml	7.50 ml
37.4 lb	17 kg	255 mg	2.55 ml	7.96 ml
39.6 lb	18 kg	270 mg	2.70 ml	8.43 ml
41.8 lb	19 kg	285 mg	2.85 ml	8.90 ml
44 lb	20 kg	300 mg	3.00 ml	9.37 ml
46.2 lb	21 kg	315 mg	3.15 ml	9.84 ml
48.4 lb	22 kg	330 mg	3.30 ml	10.31 ml
50.6 lb	23 kg	345 mg	3.45 ml	10.77 ml
52.8 lb	24 kg	360 mg	3.60 ml	11.24 ml
55 lb	25 kg	375 mg	3.75 ml	11.71 ml
57.2 lb	26 kg	390 mg	3.90 ml	12.18 ml
59.4 lb	27 kg	405 mg	4.05 ml	12.65 ml
61.6 lb	28 kg	420 mg	4.20 ml	13.12 ml
63.8 lb	29 kg	435 mg	4.35 ml	13.59 ml
66 lb	30 kg	450 mg	4.50 ml	14.05 ml
68.2 lb	31 kg	465 mg	4.65 ml	14.52 ml
70.4 lb	32 kg	480 mg	4.80 ml	14.99 ml
72.6 lb	33 kg	495 mg	4.95 ml	15.46 ml
74.8 lb	34 kg	510 mg	5.10 ml	15.93 ml
77 lb	35 kg	525 mg	5.25 ml	16.40 ml
79.2 lb	36 kg	540 mg	5.40 ml	16.86 ml
81.4 lb	37 kg	555 mg	5.55 ml	17.33 ml
83.6 lb	38 kg	570 mg	5.70 ml	17.80 ml
85.8 lb	39 kg	585 mg	5.85 ml	18.27 ml
88 lb	40 kg	600 mg	6.00 ml	18.74 ml

Vasopressin

Indications: Shock or severe hypotension

Standard Concentration: 0.2 units/ml

Stable for at least 24 hours

Dosing: 0.01 – 0.04 units/minute

Dosing Chart:

Dose (units/min)	Rate
0.01 units/minute	3 ml/hr
0.02 units/minute	6 ml/hr
0.03 units/minute	9 ml/hr
0.04 units/minute	12 ml/hr

Adverse effects: Large doses of vasopressin (e.g. > 0.04 units/minute) can cause hypertension, sinus bradycardia, arrhythmias, AV block, premature atrial contractions (PACs), coronary insufficiency, myocardial infarction, myocardial ischemia, and decreased cardiac output.

Drug interactions: Lithium and demeclocycline reduce the antidiuretic response to vasopressin by interfering with the cellular action of ADH at the collecting ducts of the nephron.

Nursing considerations:

1. Monitor BP, ECG, HR, urine output
2. Monitor serum osmolarity and serum sodium

Versed (midazolam)

Indication: For sedation maintenance in mechanically-ventilated patients

Standard Concentration: 0.2mg/ml (50mg in 250ml)

Stable for at least 10 days.

Dosing:

10-50mcg/kg bolus to initiate sedation (given slowly or infused over several minutes).

Repeat dose every 10-15 minutes until adequate sedation is achieved. Then, initiate infusion at 20-100mcg/kg/hr. (start at the lower end of the dosage range for patients with residual effects from anesthetic drugs) Adjustments should be made in increments of 25-50%. Rate should be decreased by 10-25% every few hours to determine the minimum effective dose.

Adverse Reactions: Respiratory depression, ventricular tachycardia, CNS stimulation (Versed should be discontinued should this occur)

Drug Interactions: Protease inhibitors, itraconazole, and ketoconazole may increase AUC of Versed.

Contraindications: Benzyl Alcohol allergy, closed-angle glaucoma, coma, epidural/intrathecal administration, ethanol intoxication, shock, and status asthmaticus.

Nursing Considerations: Respiratory rate, ABG's, ECG

Xigris (drotrecogin alpha)

Indication: Sepsis associated with acute organ dysfunction (APACHE II score ≥ 25)

Standard Concentration: 0.2mg/ml (20mg in 100ml) (may be 0.1 to 0.2mg/ml)

Stable for 14 hours at room temperature or 24 hours under refrigeration

Dosing:

Infusion Rate: 24mcg/kg/hour X 96 hours

At 0.2mg/ml (Standard concentration), rate = 0.12ml/kg/hr

Dose based on actual body weight at the start of the infusion

If infusion interrupted, recalculate stop time for total of 96 hours of infusion.

Dosing Chart:

Patient Weight (kg)	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130
Infusion Rate:	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6

Note: This chart is dependant on a drip concentration of 0.2mg/ml.

Adverse reactions: Bleeding

Drug Interactions: Anticoagulants, platelet inhibitors, and thrombolytic agents increase the risk of bleeding.

Contraindications: Bleeding, brain tumor, epidural anesthesia, head trauma, intracranial mass, GI bleed in last 6 weeks, and stroke.

Nursing Considerations:

1. Physician must complete Xigris worksheet and obtain verbal order from Infectious Disease or Intensivist.
2. Labs: H&H with PT daily.
3. Xigris must be run through a dedicated line or a dedicated lumen of a multi-lumen central venous catheter
4. Do not allow Xigris drip to hang more than 12 hours due to stability. (see above)
5. Discontinue Xigris 2 hours prior to undergoing an invasive or surgical procedure. Restart Xigris 12 hours after the procedure.

Apache II Score

Age in years	< 44	0 points	Arterial pH	> 7.69	4 points
	45-54	2 points		7.60-7.69	3 points
	55-64	3 points		7.50-7.59	1 points
	65-74	5 points		7.33-7.49	0 points
	over 74	6 points		7.25-7.32	2 points
				7.15-7.24	3 points
				below 7.15	4 points
History of severe organ insufficiency or immunocompromised?	Yes, and non-operative or emergency post-operative patient	5 points	Serum sodium (mMol/L)	> 179	4 points
	Yes, and elective post-operative patient	2 points		160-179	3 points
	No	0 points		155-159	2 points
		150-154		1 points	
		130-149		0 points	
		120-129		2 points	
Temperature (Celsius)	> 40.9	4 points	Serum potassium (mMol/L)	> 6.9	4 points
	39-40.9	3 points		6-6.9	3 points
	38.5-38.9	1 points		5.5-5.9	1 points
	36-38.4	0 points		3.5-5.4	0 points
	34-35.9	1 points		3-3.4	1 points
	32-33.9	2 points		2.5-2.9	2 points
	30-31.9	3 points	below 2.5	4 points	
	below 30	4 points			
Mean arterial pressure (mmHg)	> 159	4 points	Oxygenation (Only use pO ₂ if FiO ₂ < 50%)	pO₂ more than 70	0 points
	130-159	3 points		pO₂ = 61-70	1 points
	110-129	2 points		pO₂ = 55-60	3 points
	70-109	0 points		pO₂ below 55	4 points
	50-69	2 points	Oxygenation (Only use A-a gradient if FiO ₂ >= 50%)	A-a gradient < 200	0 points
	below 50	4 points		A-a gradient 200-349	2 points
		A-a gradient 350-499		3 points	
Heart rate (ventricular response)	> 179	4 points	A-a gradient >= 500	4 points	
	140-179	3 points	Respiratory Rate (non-ventilated or ventilated)	over 49	4 points
	110-139	2 points		35-49	3 points
	70-109	0 points		25-34	1 points
	55-69	2 points		12-24	0 points
	40-54	3 points		10-11	1 points
below 40	4 points	6-9		2 points	
		below 6	4 points		
Hematocrit (%)	> 59.9	4 points	White blood count (total/cubic mm in 1000's)	over 39.9	4 points
	50-59.9	2 points		20-39.9	2 points
	46-49.9	1 points		15-19.9	1 points
	30-45.9	0 points		3.0-14.9	0 points
	20-29.9	2 points		1.0-2.9	2 points
	below 20	4 points		below 1.0	4 points
Serum Creatinine (mg/dL)	> 3.4 and ACUTE renal failure	8 points	15 minus Glasgow Coma Scale = _____ points		
	2.0-3.4 and ACUTE renal failure	6 points	Total Apache II Score: _____		
	> 3.4 and chronic	4 points			
	1.5-1.9 and ACUTE renal failure	4 points			
	2.0-3.4 and chronic	3 points			
	1.5-1.9 and chronic	2 points			
	0.6-1.4	0 points			
	below 0.6	2 points			

Glasgow Coma Scale

	1	2	3	4	5	6
Eyes	Does not open eyes	Opens eyes in response to painful stimuli	Opens eyes in response to voice	Opens eyes spontaneously	N/A	N/A
Verbal	Makes no sounds	Incomprehensible sounds	Utters inappropriate words	Confused, disoriented	Converses, oriented, normally	N/A
Motor	Makes no movements	Extension to painful stimuli	Abnormal flexion to painful stimuli	Flexion / Withdrawal to painful stimuli	Localizes painful stimuli	Obeys Commands

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